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Amateur Radio

SERVING AMATEUR RADIO SINCE 1945

JANUARY 1984 \$2.00

CQ

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THE RADIO AMATEUR'S JOURNAL





TM-201A/TM-401A

Ultra-compact and lightweight, priority, memory and band scan, 25 watts/TM-201A & 12 watts/TM-401A.

The KENWOOD TM-201A 2-meter and TM-401A 70-cm FM mobile transceivers are the smallest and lightest units available, allowing maximum flexibility in automotive installation.

TM-201A/TM-401A FEATURES:

- **Ultra compact and lightweight** Measures 5.6 (141)W x 1.6 (39.5)H x 7.2 (183)D, inch(mm), weighs 2.8 lbs., (1.25 kg).
- **25-watt output, with HI/LO power switch** Produces a powerful 25 watts RF output from a surprisingly compact design (TM-201A).
- **Dual digital VFO's built-in**
- **5 memories plus "COM" channel, with lithium battery back-up (est. 5 yr. life)**
- **Memory scan/programmable band scan**
- **Priority alert scan**
- **Highly visible yellow LED frequency display**
- **High performance receive/transmit** GaAs FET RF amplifier for high sensitivity with wide dynamic range. Transmit modulation characteristics selected for best sound and minimum distortion.
- **External high quality speaker supplied (No internal speaker)**
- **16-key autopatch UP/DOWN microphone**

Optional FC-10 frequency controller

May be easily connected to the TM-201A or TM-401A. Convenient control keys for frequency UP/DOWN, MHz shift, VFO A/B, and MR (memory recall or change memory channel). A green, easy-to-read, back-lighted LCD display indicates transmit/receive frequencies, memory channel number, ALERT, and SCAN (with blinking MHz decimal). Size: 4.4 (112)W x 1.4 (35)H x 0.9 (22)D, inch(mm). Weight: 3.5 oz. (100 g).

- **Repeater offset switch (± 600 -kHz/TM-201A; ± 5 MHz/TM-401A; and simplex) and reverse switch**
- **Audible "BEEPER" confirms operation**
- **Easy-to-install mobile mount**

TM-201A/TM-401A accessories:

- **TU-3** programmable two-frequency CTCSS encoder
- **KPS-7A** fixed station power supply



TW-4000A

FM "Dual-Bander"... 2-m & 70-cm in single compact package, LCD, 25 W, optional voice synthesizer.

KENWOOD's TW-4000A FM "Dual-Bander" provides new versatility in VHF and UHF operations, uniquely combining 2-m and 70-cm FM functions in a single compact package.

TW-4000A FEATURES:

- **2-m and 70-cm FM in a Compact Package** Covers the 2-m band (142.000-

148.995 MHz), including certain MARS and CAP frequencies, plus the 70-cm FM band (440.000-449.995 MHz), all in a single compact package. Only 6-3/8 (161)W x 2-3/8 (60)H x 8-9/16 (217)D inches (mm), and 4.4 lbs. (2.0 kg).

- **Large, Easy-to-Read LCD Display**
- **25 Watts RF Power on 2-m/70-cm.**
- **Opt. "Voice Synthesizer Unit"** Installs inside the TW-4000A. Voice announces frequency, band, VFO A or B, repeater offset, and memory channel number.
- **Front Panel Illumination**
- **10 Memories with Offset Recall and Lithium Battery Backup**
- **Programmable Memory Scan**
- **Band Scan in Selected 1-MHz Segments**
- **Priority Watch Function**
- **Common Channel Scan**
- **Dual Digital VFO's**
- **16-Key Autopatch UP/DOWN Microphone**
- **Repeater Reverse Switch**
- **High Performance Receiver/Transmitter** GaAs FET RF amplifiers on both 2-m and 70-cm, high performance MCF's in the 1st IF section, provide high receive sensitivity and excellent dynamic range. The high reliability RF power modules assure clean and dependable transmissions on either band.

- **Rugged Die-cast Chassis**
- **"BEEPER" sounds through speaker.**
- **Easy-to-Install mobile mount**

TW-4000A accessories:

- **VS-1** voice synthesizer
- **TU-4C** programmable two-frequency CTCSS encoder
- **KPS-7A** fixed station power supply
- **SP-40** compact mobile speaker
- **SP-50** high quality mobile speaker
- **MA-4000** dual-band mobile antenna with duplexer

KENWOOD

TRIO-KENWOOD COMMUNICATIONS

1111 West Walnut, Compton, California 90220



TS-830S

"Top-notch"...VBT, notch, IF shift, wide dynamic range

The TS-830S has every conceivable operating feature built-in for 160-10 meters (including the three new bands). It combines a high dynamic range with variable bandwidth tuning (VBT), IF shift, and an IF notch filter, as well as very sharp filters in the 455-kHz second IF.

TS-830S FEATURES:

- LSB, USB, and CW on 160-10 meters, including the new 10, 18, and 24-MHz bands. Receives WWV on 10 MHz.

- Wide receiver dynamic range. Junction FETs in the balanced mixer, MOSFET RF amplifier at low level, and dual resonator for each band.
- Variable bandwidth tuning (VBT). Varies IF filter passband width.
- Notch filter high-Q active circuit in 455-kHz second IF.
- IF shift (passband tuning).
- Noise-blanker threshold level control.
- Built-in digital display, (fluorescent tube), with analog dial.
- 6146B final with RF negative feedback. Runs 220 W PEP (SSB)/180 W DC (CW) input on all bands.
- Built-in RF speech processor.
- Narrow/wide filter selection on CW.
- SSB monitor circuit.
- RIT and XIT (transmitter incremental tuning).

Optional accessories:

- SP-230 external speaker.
- VFO-230 external digital VFO with five memories, digital display.
- VFO-240 external analog VFO.
- AT-230 antenna tuner.
- YG-455C (500 Hz) or YG-455CN (250 Hz) CW filter for 455 kHz IF.
- YK-88C (500 Hz) or YK-88CN (270 Hz) CW filter for 8.83 MHz IF.
- KB-1 deluxe heavyweight knob.

NEW



TS-530SP

"Cents-ational"...notch, IF shift, digital display, narrow-wide filter switch

The TS-530SP SSB/CW transceiver covers 160-10 meters using the latest, most advanced circuit technology, yet at an affordable price.

TS-530SP FEATURES:

- 160-10 meters, LSB, USB, CW, all amateur frequencies, including new 10, 18, and 24 MHz bands. Receives WWV on 10 MHz.
- IF shift tunes out interfering signals.

- Audio notch filter, tunable, for minimum QRM.
- Built-in digital display (six digits, fluorescent tubes), with analog dial.
- Narrow/wide filter selector switch for CW and/or SSB.
- Built-in speech processor, for increased talk power.
- Wide receiver dynamic range.
- Two 6146B's in final, allows 220W PEP/180 W DC input on all bands.
- Advanced single-conversion PLL, for better stability, improved spurious characteristics.
- Adjustable noise-blanker, with front panel threshold control.
- RIT/XIT front panel control allows independent fine-tuning of receive or transmit frequencies.

Optional accessories:

- SP-230 external speaker with selectable audio filters.
- VFO-240 remote analog VFO.
- VFO-230 remote digital VFO.
- AT-230 antenna tuner/SWR/power meter.
- MC-50 desk microphone
- KB-1 deluxe VFO knob.
- YK-88C (500 Hz) or YK-88CN (270 Hz) CW filter.
- YK-88SN (1.8 kHz) narrow SSB filter.



TS-130SE

Compact, solid-state HF, 80-10 m, incl. WARC.

- 200 W PEP, 160 W DC.
- Digital display.
- IF shift, narrow/wide filter switch. (Filters opt.)
- Speech processor, VOX.
- RF attenuator, noise blanker.
- CW semi break-in w/sidetone.
- Final amp. protection circuit.
- Size: 3-3/4 H x 9-1/2 W x 11-9/16 D.

Optional accessories:

- PS-30, KPS-21 Power supplies.
- SP-120 External speaker.
- VFO-120 remote VFO.
- AT-130 antenna tuner.
- YK-88C (500Hz), YK-88CN (270Hz) CW filters.
- YK-88SN (1.8 kHz) SSB filter.
- MB-100 mobile mtg. bracket.

KENWOOD

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1111 West Walnut, Compton, California 90220

FM-2033

2m C-MOS MICROPROCESSOR CONTROLLED
DIGITAL SYNTHESIZER FM TRANSCEIVER

Shown actual size.



Exclusive KDK 6 in 1 control is now joined by 6 exciting new KDK features:

NEW! % Soft Orange background Liquid Crystal Display (LCD) for direct sunlight viewing plus lighting for night viewing.

NEW! % Offset (+, -, S) stored in memory along with the frequency information.

NEW! % Frequency coverage of 142.000 to 149.995 MHz for M.A.R.S. and C.A.P. usage.

NEW! % Chrome front panel with accent knobs and lighter color on case to match today's auto decor.

NEW! % Scan for signal now has 3-second delay before resume after loss of signal.

NEW! % Repositioned controls for more convenient operation.

The Exclusive KDK 6 in 1 Knob.



- Only memories with data are scanned; blanks are skipped.
- Complete memory back-up with power unplugged. Re-chargeable Ni-Cd with capability of several months back-up of memory.
- Single frequency sub-audible tone generator included as a standard feature.
- Tone unit switch on front panel to prevent "humming" on the wrong channel.
- Repeater input monitor capability with the push of a single momentary switch.
- Solid-state level meter for both output level and input level monitoring.
- User programmable initial characteristics for band limits, channel step size, etc.
- Odd repeater splits can be handled with the memory in the AxB mode.
- Programmable band-scan limits are stored in protected RAM.
- Modular construction with pluggable inter-connecting wiring.
- Touch-Tone[®] microphone TM-2 is standard with each radio.
- Change channels, skip-scan or step up and down the band from TM-2 microphone.
- Audible beep for end-of-band or last memory location for better "eye's off" operation.

The KDK FM-2033 represents a significant advance in user convenience and simplicity of operation for the radio user. The KDK '33' series of transceivers provides excellent readability in any lighting condition for either the operating frequency or the memory channel number in use. The use of a warm orange background for the LCD displays improves the readability by providing an easy on the eyes contrast improvement.

Simplicity of operation has always been the mark of the KDK design team and the FM-2033 is no exception. From the single knob frequency and memory selection to the automatic recall of the desired repeater offset from memo-

ry, the FM-2033 continues to provide relaxed, comfortable mobile operation.

Once the 10 memory frequencies have been selected, a single knob is all that is required for operation on the standard simplex or repeater channels. Using the audible beep as the end of memory marker allows setting to a particular channel without even looking at the radio.

In the scan mode, scanning for a busy memory or pre-programmed band scan keeps you up to date on the happenings in the area. Very busy frequencies can be skipped by using the up key on the TM-2 microphone. If a full 10 memories are not used, the unused ones can be marked for scan skip so that no time is wasted checking them.

The FM-2033 provides a clean 25 watt output signal across 142 - 149.995 MHz to operate in balance with most repeater signals and provide quieting on the simplex operations. M.A.R.S. (NAVY too!) and C.A.P. frequencies are also accommodated.

You want convenience, reliability and easy operation for your mobile station and a tough to beat dollar value. Check out the FM-2033 at your local dealer TODAY or send a QSL for specifications.

[®] Touch Tone is a Registered Trade Mark of American Telephone and Telegraph.

Specifications are nominal and are subject to change. All KDK transceivers meet or exceed FCC regulations regarding spurious emissions.



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The Radio Amateur's Journal

ON THE COVER: A.J. Stockton, IV, N5FUS, operates bicycle mobile for our camera (and not in traffic). He symbolizes the new, young amateurs joining our ranks. At 14 he holds a General Class license and has his ticket for almost 6 years. Photo by Larry Mulvehill, WB2ZPI.



JANUARY 1984

VOL. 40, NO. 1

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Zero Bias

AN EDITORIAL

Grenada had been a sensitive subject with me even before the invasion last October. George Wagner, K5KG, had buttonholed me at the Houston Convention to remind me that I had his article on a DXpedition to Grenada in my files—was I going to use it and when? I said I would be using it around the beginning of the year, probably January (obviously I did). We both talked about Grenada and although it was a great place for a vacation, it really wasn't that interesting to amateurs as a hot spot for DX. A few weeks later we were both surprised. After Houston I did get his article out and did work on it, so when the story broke around the world and pictures of Grenada finally appeared on TV, I knew exactly where it was all happening. If you check the pictures in the article on page 44, you too will see some familiar spots.

Over the last few weeks I've received numerous news-clippings, phone calls and letters from stateside amateurs who were involved in the very dramatic amateur radio coverage of the Grenada invasion and ultimate rescue of the medical students. One young man from New Jersey, Mark Barettella, gained instant fame and world recognition for both himself and amateur radio for his role in letting the world know what was happening as it was happening. While the stateside amateurs were available for immediate press coverage and TV shots, Mark was stretched out on the floor in a building in Grenada, undoubtedly frightened, listening and reporting on the sounds of war. It was a remarkable transition for a young man to go from medical student to celebrity in a few short hours. Ultimately Mark will return to being a medical student again, but for the near future he is our hero, our spokesman, and our best PR agent. After speaking with Mark and several people who know him in connection with our lead article, you do come away with the feeling that Mark is amazed by this whirlwind of adulation and attention. He seems very level-headed and believes that any one of us would have done the same thing in the situation.

I met Mark, very briefly, at the Radio Club of America's 75th Anniversary Diamond Jubilee Banquet this past week. Amidst this august body of scientists, inventors, business and industry leaders, some of whom trace their phenomenal careers back to the days of Dr. Lee DeForest, came Mark Barettella, KA2ORK. The people who had helped to change the world via electronics, the movers and shapers, were also there that evening to see and listen to Mark. He was a peer, he

had shaped and moved history via electronics.

I think that Mark would be happier to describe himself in far less grandiose symbols, but in fact he is a great role model for the youth of tomorrow. Like the young man on the cover, Mark is close enough in age so that a young person can identify with him. The Grenada fete was not that technically difficult, nor was highly sophisticated training and equipment needed. What was involved is character, personal involvement and a willingness to do more than just what is required. We have a wonderful natural resource in Mark. He does in fact typify the sort of amateur we would all like to grace our ranks and the kind of amateur we say we would like to have more of.

It's up to all of us who want amateur radio to grow and prosper to find a way to keep this spirit alive and productive. Mark can't assume the responsibility for the future of amateur radio. He has his studies to resume and his own life to continue. Just as he was in the right place at the right time and seized the opportunity, we too are now at that point. He's opened the door for us in other areas too. Mark's experiences have probably gone a long way to improve community and good neighbor relations as well. If you neighbors watched the event on Grenada unfold on TV they now have a pretty good idea of the positive things amateur radio can do. They may be more tolerant of a new antenna or not so quick to blame you for interference.

All in all it was and is a very positive thing for amateur radio. We're all proud of Mark and what he's done for amateur radio. However tall we may stand or warm ourselves in the glow of this event, let's remember that through his personal risk information was exchanged, people's fears allayed and many hundreds of people knew they weren't alone.

As this is being written during Thanksgiving week when we all have a lot to be thankful for, there is one additional facet to this story. Many of you know by now that when Mark had to leave Grenada in a hurry, the now famous Swan 500CX had to be jettisoned. We've arranged through the kind and generous cooperation of ICOM and Evelyn Garrison of ICOM to present Mark with a new ICOM 720A and PS15 power supply. The rig arrived at the CQ office today and will be presented to Mark in the next few days.

So What Else Is New?

Don't forget the CQ WW DX 160 Meter C.W. Contest coming up January 27-29.

It's a fun contest with perhaps some very interesting DX showing up. It's also a contest where you really don't need tremendous power to work out. Check page 56 for the complete rules.

It looks as though we'll finally get to the annual big one in Wheaton, Illinois this year. This one day event has always been touted highly but the Miami Hamfest has always been held the same weekend. This year they're a week apart, so the intrepid CQ Team will head north to Wheaton. Check the Announcements column for specifics.

Of course look for us in Miami the following week. It's always good to get a few days of sun in when the snow season hits New York.

73, Alan, K2EEK

Victor C. Clark, W4KFC November 25, 1983

It is with sadness that I report the sudden and unexpected passing of ARRL President Vic Clark, W4KFC. Vic was a tireless and devoted worker for amateur radio. He could be counted on to speak at any occasion where amateurs gathered and extoll the virtues of amateur radio. He championed the League and was a very able spokesman for the ARRL.

Vic was recently made a Fellow of the Radio Club of America, an honor which he richly deserved. It was on this occasion, one week ago, that I last saw him and spoke to him. We will all miss this quiet-spoken, sincere and gentle man who brought so much to amateur radio.

Our condolences go out to the Clark family for their loss, a loss which we all share.

In the interim, First Vice President, Carl L. Smith, W0BWJ, will assume the office of ARRL President. An election for President will follow.

Those of you who are ARRL members know Carl as a devoted worker for the League and amateur radio. This will be a rough time for Carl and we wish him every success.

Although you will be reading this some time after the event, the family's wishes were that in lieu of flowers, a donation be made to a special ARRL fund to be set up as a Victor Clark, W4KFC, Memorial Scholarship Fund. You can check with the ARRL for specific details on this fund.

—K2EEK

Expand and Protect Your RTTY Text DSK 3100



DSK3100-DS3100ASR-ST6000 SYSTEM

The BEST RTTY system just got better! The DSK3100 may be added to any DS3100/MPT3100 terminal to give greatly expanded storage of text files. Best of all, files don't "go away" when power goes off! The DSK3100 builds on the already outstanding features of our super-terminal and adds even more versatility to text editing, mailbox, and traffic handling features. The two disk drives give text storage ten times that of the MSO3100 and MPT3100. Outstanding features:

- Save all your message and text on two 5.25" diskettes
- Store up to 326,000 characters in 511 files
- Storage is equivalent to 4500 lines, 90 pages, 80 ft. of TTY paper, or 15 hours of text at 60 WPM!
- Save all TEN HERE IS messages on disk
- Save all DS3100 turn-on parameters on disk
- New clock includes power protection and autodate
- New printer output for parallel interface printers
- Access disks directly from your computer with USER I/O
- Build your own text library by just changing diskettes
- Combine two files with new INSERT command
- New MSO directory is shorter and faster to send
- Cabinet matches ST6000 (3.5 x 17 x 9"; 12 lbs)
- One cable connection to MPT3100 terminal
- Operate from either 120 or 240V, 50/60 Hz power.

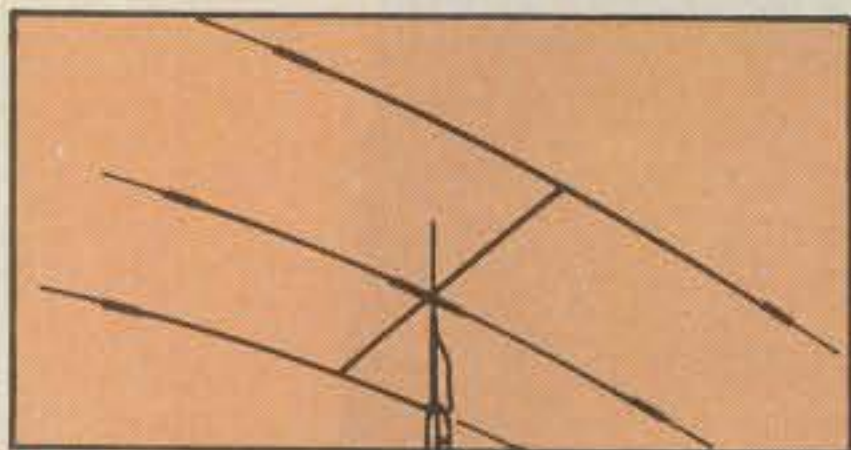
The DSK3100 adds non-volatile memory and extended storage features you, our customer, need. Rather than designing a new product to replace it, we have again up-dated the DS3100 to make it truly the most advanced and user-friendly RTTY system sold. With the addition of the DSK3100, the DS3100 remains the unchallenged leader in state of the art communications. Write for our latest RTTY catalog and see the DSK3100 at your favorite HAL dealer.



HAL COMMUNICATIONS CORP.
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URBANA, IL 61801 • (217) 367-7373 • TWX 910-245-0784 (HALCOMM URB)

Tribander Beams For 10-15-20 Meters

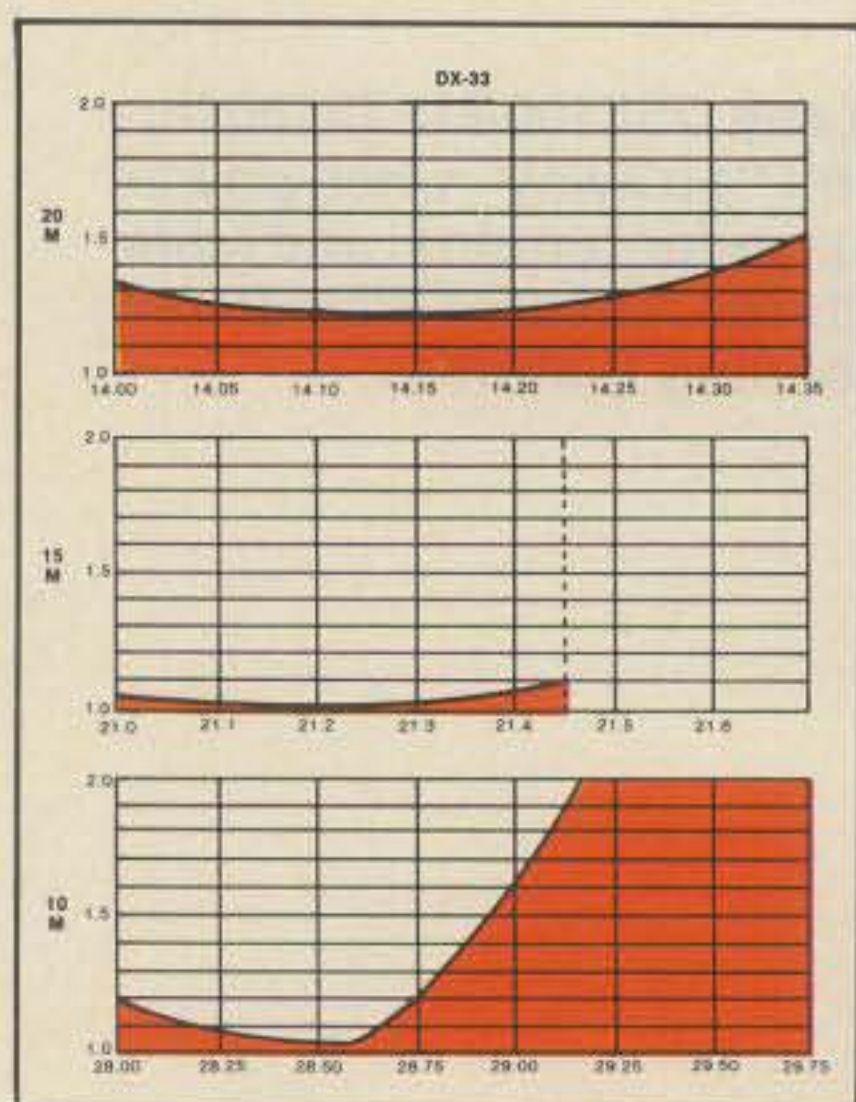
"WESTERN PENETRATOR" DX-33 3-element tribander DX-34 4-element tribander



- Expertly engineered.
- Outstanding performance.
- Wider bandwidth.
- High strength tubing.
- Each trap individually sweep frequency tested.
- Reinforced center sections.
- Stainless steel "U" bolts.
- Competitive price.
- Low SWR.

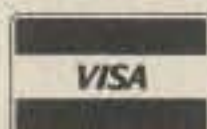
The Western Penetrator is a new force to be reckoned with! It will help you penetrate the four corners of the earth and will provide years of maintenance free operating pleasure.

Outstanding design and strict quality control combine to produce a superb contest winning antenna.



DX-33 3-element tribander • \$219+UPS
DX-34 4-element tribander • \$299+UPS

Write or call today for complete specifications and exact UPS charges to your home. Send for FREE catalog describing the Western Penetrator, and our complete line of Noise Bridges, SWR Meter, Baluns, VLF equipment, Antennas and more.



Palomar Engineers

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Phone: (619) 747-3343

Announcing

• **Rats Nest and Crooked Stick Antenna Experimenter's Contest Sprint** - Odd as this may sound, here are some of the basic rules for this event sponsored by the Issaquah ARC. The sprint will be held from 2100Z January 8 to 0100Z January 9. Frequencies are c.w. 21.060 to 21.200 MHz, and s.s.b. 21.350 to 21.450 MHz. The following constitutes a "rats nest and crooked stick antenna": 100 feet maximum of single conductor wire (solid or stranded), any configuration; antenna height is limited to 200 feet at the center of the high current. Transmitter power is 250 watts or less (d.c. input). Exchange name, QTH, antenna type, IARC member or not. Certificates will be awarded. Contest entries must be submitted by February 1, 1984. For more information, contact IARC, Bob Farnworth, KB7NV, 6822 131st Ave. SE, Bellevue, WA 98006 (s.a.s.e.).

• **HOSARC Special Event Station** - The Hall of Science ARC will issue a certificate to anyone working a HOSARC club station on January 15 from 1400 to 2300 UTC. Stations using the call WB2JSM will operate c.w. in the first 25 kHz of the Novice bands of 40, 15, and 10 meters. Stations using WB2ZZO will operate s.s.b. in the first 25 kHz of the general phone bands of 40, 20, 15, and 10 meters. QSL with a large s.a.s.e. (40¢ or 1 IRC) to HOSARC, P.O. Box 131, Jamaica, NY 11415, or to WB2YXB, club QSL manager.

• **Yonkers Electronics Auction** - On Sunday, January 22, the Yonkers ARC will sponsor this auction at Lempko Hall, 556 Yonkers Ave., Yonkers, NY from 9 a.m. to 3 p.m. There will be prizes, and an auction at 10 a.m. Admission is \$3.00, children under 8 free. Talk-in on 146.265T/146.865R. For more information, contact YARC, 53 Hayward St., Yonkers, NY 10704, telephone 914-969-1053.

• **Michigan Special Event** - The Michigan Technological University ARC and the Copper Country Radio Amateur Assoc. will celebrate the Upper Peninsula's Winter Carnival by issuing a certificate to all amateurs who contact a participating ham in the Copper Country between 0000 February 2 and 0000 February 8. Only one contact is required. Frequencies will be RTTY 3.630, 7090, 14.095; c.w. 3.705, 7.085, 14.085, 21.085, 28.185; s.s.b. 3.930, 7.285, 14.305, 21.385, 28.685. Send QSL and three 20¢ stamps to Howard Junkin, N8HFH, 106 W. South Ave., Houghton, MI 49931.

• **Dayton Hamvention** - Plan early for the Dayton Hamvention, which will be held on April 27-28 at the Hara Arena and Exhibition Center, Dayton, OH. For a brochure, write to Dayton Hamvention, Box 44, Dayton, OH 45401. This is the biggest amateur radio event of the year!

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Our Readers Say:

Getting Into RTTY

Editor, CQ:

I really enjoyed the November issue with the focus on RTTY. It just so happened that I had been looking at RTTY gear for quite some time and finally had enough pennies saved that I had to make a decision as to what to get.

The review of the AEA CP-1 by Dave Ingram, K4TWJ, was especially of interest since I had been hearing some good things about it. However, it did leave me with some unanswered questions. I wanted hardcopy and I wanted to use a Centronics compatible printer with my VIC-20 on RTTY.

To make a long story short, I bought a CP-1 from CCOMM in Seattle, picked up an interface for the printer from a local electronics shop, and set it all up.

With the software supplied, AEASOFT™ MBATEXT™, it is no problem to get a hardcopy of both transmitted and received text. Hopefully, this will answer a few more questions for any others contemplating buying a CP-1.

Being new at RTTY, all I can say about the CP-1 is that it is easy to connect, easy to tune, and easy to use. With the price of VIC-20 computers being quite low and the CP-1 at a reasonable price, it is a simple means of getting into this mode of operation.

Thank you for consistently publishing a magazine that always seems to have something for me.

Tim Tapio, N7BFG
Rochester, WA

A Positive Solution

Editor, CQ:

I found the article in your September 1983 issue by Michael S. Drooker, "Living with the Lead-Acid Battery," interesting. A worthy note I would like to add is that most manufacturers' radio equipment is rated at 12 to 16 v.d.c. A 12 v.d.c. battery at 25% discharged and 20 amp load would deliver 11.5 v.d.c. At 60 to 70% discharged I suspect that less than 10 to 10.5 v.d.c. would be available at such load.

A solution to this problem would be to purchase a 6 v.d.c. and 8 v.d.c. battery and connect both in series. For those who did not know an 8 v.d.c. battery existed, consult the Sears catalog. Listed under commercial batteries are 110 and 140 reserve capacity rated 8 v.d.c. batteries. Find a 6 volt battery of the same or close rating and connect it in series. For matching, I prefer the reserve capacity to the cold cranking amps for deep discharge service. The batteries have extra wide separators and high density plates

which suggest deep discharge design. If in doubt, consult the battery manufacturer. Another source might be a farm-supply or industrial store. I found both on sale for \$38.95 each.

James Benedict
Pt. Huron, MI

Net Controls and VOX

Editor, CQ:

Just began reading the October '83 issue and would like to add my thoughts to N1API's letter referring to DX Net Control Stations. As with the distorter (processor) switch on today's transceivers, let's make DX nets a thing of the past! How can I consider it an accomplishment when I piggyback someone else to work a DX station? And then I want an award for doing so? The real enjoyment is finding and working that rare DX on my own. If I have someone else help me, and then have the whole world stand by while I work him, is it MY accomplishment, or that of the guy who helped me? It's his, of course.

On the subject of pet peeves, why is it so difficult to get people to use VOX? It's standard equipment now, yet very few use it. Why? Those long CQ's could be greatly shortened and all those unnecessary ID's would also be reduced, thus reducing QRM.

Let's turn those processors off with their related hum, background noise (dog, kids, TV, wife, fan, air-conditioner, etc.), and really make the ham bands sound good again!

Ben Piller, K9CSM
Bennett, CO

Headphones Worth Noting

Editor, CQ:

Just a note about a handy product I have found. The current year's "big book" in the music amplifiers section sells a pair of headphones with a guitar amplifier built in. The phones are switchable and can be used as stereo phones. However, I, being an s.w.l.'er, have experimented and used them as DX phones in the amplifier setting. On my receiver they pull out a signal of negative 1 dB with enough volume and clarity to make it easily understood. They are also very tolerant of higher volume-gain input voltages. (How about weak DX Morse?!) The amp is powered by a 9 volt battery which seems to last forever.

The only drawback seems to be that they don't fit very well. But for less than \$30?

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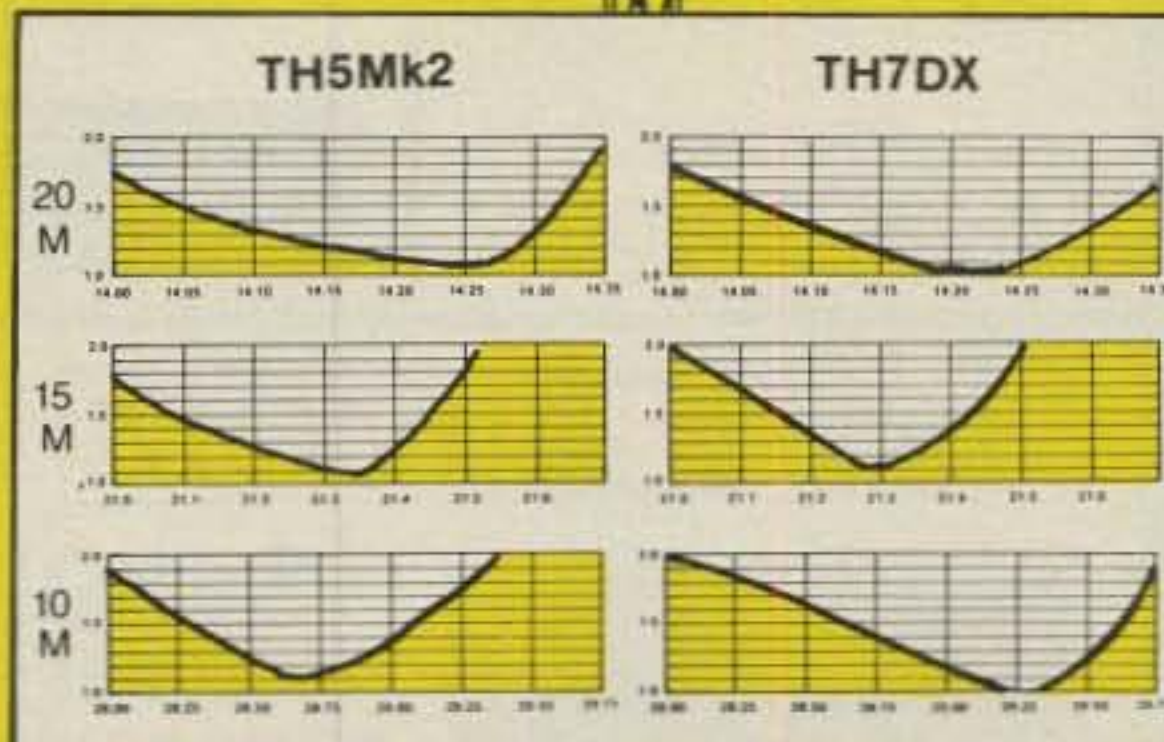
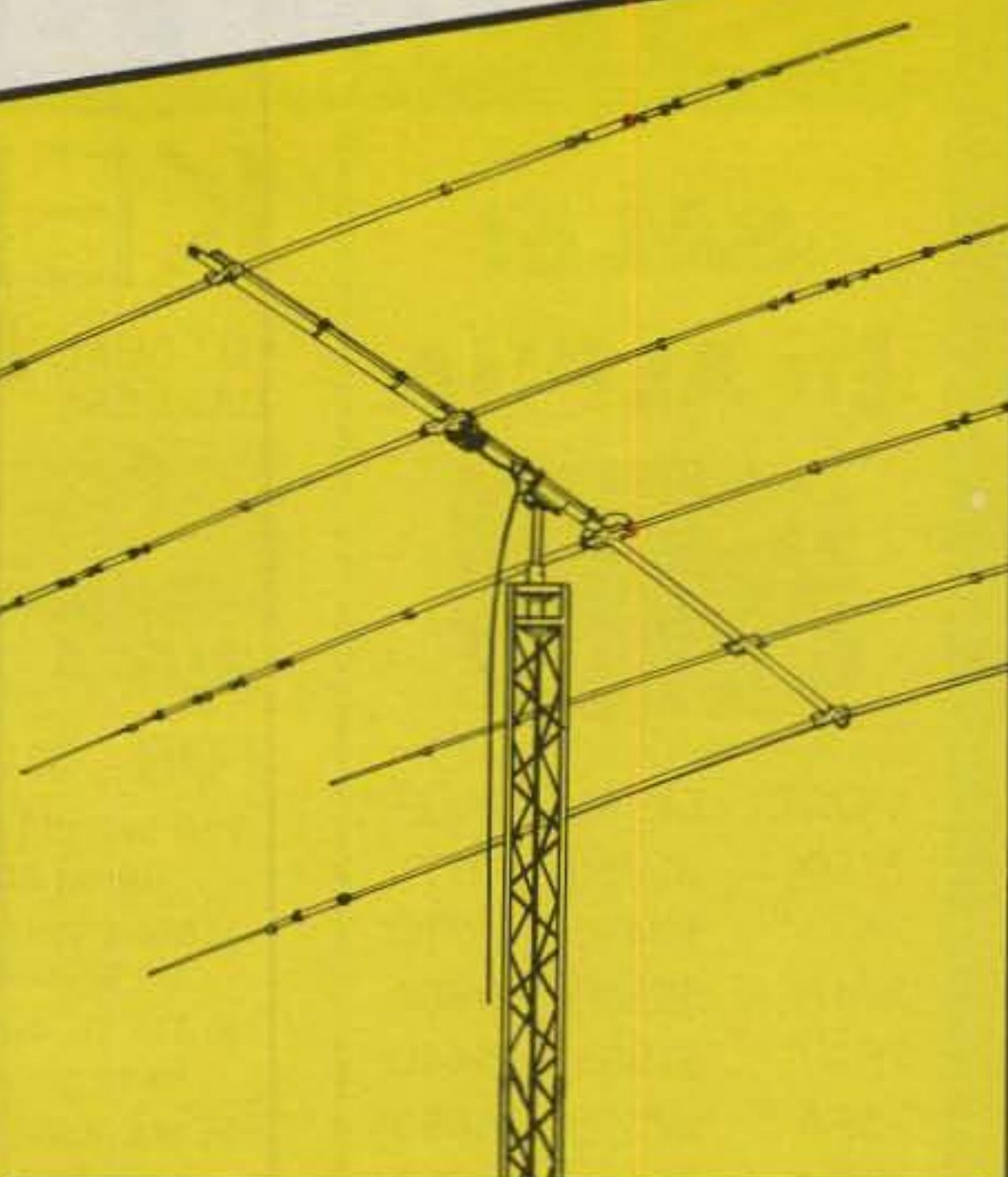
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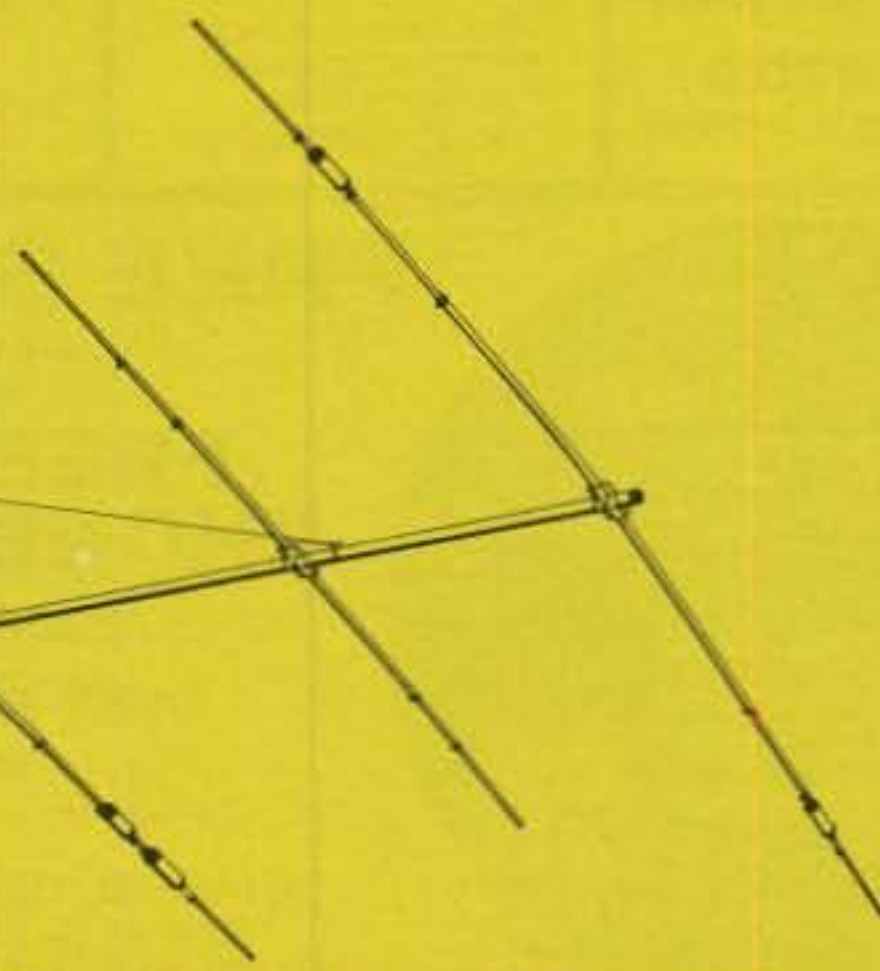
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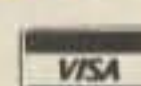
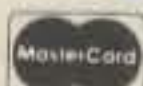
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Mark Barettella, KA2ORK/J3 Tells His Own Story

Amateur Radio and the Grenada Rescue: A Personal View

BY STEVE MENDELSON*, WA2HDF, AND MARK BARETTELLA†, KA2ORK/J3

“Do I know anything about communications? Well, I've been a ham radio operator for several years. The Telex® machine? Sure I know how they work. Will it work no matter what? Sure it will if nobody cuts the wire or fires a gun at it.”

With those slightly prophetic words, Mark Barettella, KA2ORK/J3, informed Dr. Brown, Professor of Psychiatry and an administrator of student affairs at St. Georges University School of Medicine at Grenada, West Indies of what to expect from the Telex® machine following the military coup on the island of Grenada on October 19, 1983.

For the non-DX'ers in the crowd, allow me to explain that Grenada is one of the southern most of the Windward Islands, is in the Caribbean sea, and is north of Venezuela's coast. It is called the Spice Island because of all of the flora that abound on it.

For the last several years, the government has been a socialist one with Mr. Maurice Bishop as its Premier. Mr. Bishop's government renounced ties to the west and allowed Cuban workers in to improve conditions, and build a 10,000 foot runway for a "tourist" airport at Point Salinas on the southern part of the island. However, President Reagan of the United States believed that the runway was being built to accommodate Russian long-range aircraft. Therefore, the U.S. kept a watchful eye on this small island.

Knowing nothing about all of the political undercurrents taking place on this seemingly quiet island, Mark Barettella, KA2ORK, went to study medicine at St. Georges University. But Mark, who had been an amateur for two years, didn't know he was about to have the adventure of his 23 year life.

For 36 hours, Mark and another amateur on Grenada, Don Atkinson, J37AH, a

retired salesman from the Hartford Connecticut area, were the lifeline of information for millions of listeners on radio and television all over the world. The Reagan administration had declared a news blackout, but Mark, displaying the traits that make the classic American hero, stayed with his rig until the very end when he was finally rescued. At least that's what all the amateurs listening thought. The truth was that the college administration would not let Mark out of his room! He would have loved to go out for a walk, but they insisted that he stay on the air as

long as possible as he was the only amateur on campus. But that's getting ahead. Let's go back to the beginning.

In 1981, Mark had participated in a walkathon as the medical crew captain in Wilkes-Barre, PA. One of those at Mark's position was Tom Miller, a local amateur. Tom's Icom attracted Mark, who asked about its autopatch capability. Fascinated by amateur radio, he spoke to a fellow student, also an amateur, and found the needed information necessary to get a license. Then it was off to the nearest radio store to purchase a license manual.



To commemorate Mark's accomplishment, the ARRL awarded Certificates Of Merit to those involved. From left to right: Steve Lomazo, N2DRA, Mark Barettella, KA2ORK, Fred Jacobs, KC2PK, and Bob Neukomm, KB2WI. Bob is the N.J. ARRL Section Manager and he provided the major monitoring point for all N.Y. based media, including the three networks, local TV stations, and newspapers. The presentations were made by George Diehl, W2IHA and Steve Mendelsohn, WA2DHF, the Hudson Division Director and Vice-Director at the Ridgefield Ambulance Corps building where Mark is a member.

*64 Maiden Lane, Little Ferry, NJ 07643,
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Receiver. Utilizing an ICOM developed J-FET DBM, the IC-751 has a 105dB dynamic range. The 70.4515MHz first IF virtually eliminates spurious responses, and a high gain 9.0115MHz second IF, with ICOM's PBT system, gives the ultimate in selectivity. A deep IF notch filter, adjustable AGC and noise blanker (can be adjusted to

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Transmitter. The transmitter features high reliability 2SC2904 transistors in a low IMD (-38dB @ 100W), full 100% duty cycle (internal cooling fan standard), 12 volt DC design. Quiet relay selection of transmitter LPF's, transmit audio tone control, monitor circuit (to monitor your own CW or SSB signal), XIT, and a high performance speech processor enhance the IC-751 transmitter's operation. For the CW operator, semi break-in or full QSK is provided for smooth, fast break-in keying.

Dual VFO. Dual VFO's controlled by a large tuning knob provide easy access to

split frequencies used in DX operation. Normal tuning rate is in 10Hz increments and increasing the speed of rotation of the main tuning knob shifts the tuning to 50Hz increments automatically. Pushing the tuning speed button gives 1KHz tuning. Digital outputs are available for computer control of the transceiver frequency and functions, and for a synthesized voice frequency readout.

32 Memories. Thirty two tunable memories are provided to store mode, VFO, and frequency, and the CPU is backed by an internal lithium memory backup battery to maintain the memories for up to seven years. Scanning of frequencies, memories and bands are possible from the unit, or from the HM12 scanning microphone. In the Mode S mode, only those memories with a particular mode are scanned; others are bypassed. Data may be transferred between VFO's,

from VFO to memories, or from memories to VFO.

Standard Features. All of the above features plus FM unit, high shape factor FL44A, 455 KHz SSB filter, full function metering, SSB and FM squelch, convenient large controls, a large selection of plug-in filters, and a new high visibility multi-color fluorescent display that shows frequency in white, and other functions in white or red, make the IC-751 your best choice for a superior grade HF base transceiver.

Options. External frequency controller, external PS15 power supply, voice synthesizer, computer interface, internal power supply, high stability reference crystal (less than ± 10 Hz after 1 hour), HM12 hand mic, desk mic, filter options:

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FL32, FL63
AM: FL33

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Others.

ICOM's extensive product line includes accessories for every need: IC-PS15 power supply, IC-MT100 manual antenna tuner, IC-PP1 phone patch, IC-HP1 headphones (shown), IC-SM6 desk mic (shown), IC-GC4 world clock (shown), mobile mounting brackets, plus much more.

See ICOM equipment at your local ham store.

CIRCLE 143 ON READER SERVICE CARD

 **ICOM**
The World System

"All of this during finals week," remembers Mark. "I stopped studying medicine, and started studying for the Novice license. That is probably why I am in a foreign medical school now rather than an American one."

When it was time to head home for Christmas in Ridgefield, N.J. he took a quick course in Morse code courtesy of an ARRL training tape. After a visit to local amateur Ron Bosco and passing the Novice test, a chance conversation led him to find the gear belonging to the deceased father of a friend—a welcome donation for a poor college student. Now, armed with his newly found equipment and the KA2ORK license, he set up his first station in the basement and proceeded to enjoy amateur radio.

January of 1982 rolled around too quickly for Mark, and it was off to school again for the second half of his senior year at Wilkes College. While in school he would take his keyer out, and practice sending to himself. All he had was the keyer, and although he gathered no QSL's at that time, he did increase his proficiency. After college graduation he returned home to a big welcome and dreams of passing his Technician test. Even though he had no gear for either v.h.f., or u.h.f., he took the test "just to get it out of the way." Not having the money to buy a new low band rig, he finished the summer and departed for medical school in Grenada and his first semester on the island.

Life in the third world is a bit different. To get a license, one goes to the Minister of Construction, not the Minister of Communications. He put Mark on to the Wireless and Telecommunications officer who finally grants the license. Mark could now operate anywhere where amateur radio is legal. The philosophy is that if you have a license, you have a license, and to heck with separate privileges. It is the best of reciprocal licensing. However, studying took all precedence for this first semester student, and amateur radio was forgotten for a while. Second semester rolled around, and Mark was able to finally get his head out of the books long enough to look around the campus. He found that a Swan 500 was "under a shelf gathering dust in the Audio Visual repair room in the lecture hall on the main campus at True Blue."

(A short digression from our story. Contrary to many reports, the term "True Blue" is not a military code word, but the name of the town that the campus is located in. It is 2.6 miles from the Grand Anse campus.)

Taking the rig to his room, he found the finals soft, and one week later, departed for home on semester break during the summer of 1982 leaving the rig behind. That summer, in keeping with his rule of "a new class of license each year," he got his Advanced class license. Another event that was to have a great impact that summer was an invitation from Gary Wil-

lis, KA2FBO, to operate during Field Day with the Nutley Amateur Radio Club. Mark was now totally hooked on amateur radio.

In late August, 1982, Mark returned with his watt meter, new finals, and cables. Now the Swan worked like never before with the shiny new finals, and it was matched to a new antenna, a B&W 5 band trapped dipole.

In the spring of 1983 a rather persistent station had heard Mark talking about the medical school, and took the time to wait on frequency. Steven Lomazow, N2DRA, had decided to talk to Mark about his career. Steve and Mark talked for several hours, and ended up making schedules to meet on the air and talk from that point on.

Within days of Mark's return to Ridgefield that summer, he had an accident that left him in the hospital for several weeks. After he got out he found a slip of paper with a phone number and the call N2DRA written on it. He phoned, and the relationship between a DX station and his QSL manager was born.

Summer of 83 over, it was time to return once again to Grenada, and the third semester of Mark's second year. Every Monday at 0230Z, Mark and Steve could be found on 14.250 talking.

During this time, Fred Jacobs, KC2PK, was also keeping a schedule with Don, J37AH. During one of those schedules Mark broke in to tell Fred that he was in a position to let Fred talk with his daughter Stephanie, another student on the Grand Anse campus. Fred now joined the daily schedule that Mark was keeping with Steve. Stephanie also talked on early Sunday mornings with her Dad, and everyone enjoyed the hobby. It was now three weeks prior to the coup that would topple the government of Maurice Bishop.

For the next three weeks, everything was quiet. But between the 14th and 15th of October, the Assistant to the Prime Minister Coard and Grenadian General Hudson Austin changed the quiet that normally enveloped the island. A political difference with Maurice Bishop caused Mr. Coard to resign from the socialist government and decide to form a more radical government. The coup, and its aftermath, cost Premier Bishop his life, and started riots in the island's capitol, St. Georges.

Immediately after the coup, Mark, sensing a potential problem, hid the rig and antenna in a body bag in the Anatomy room. Within hours, the questions started coming from the administration about the Telex®. The machine was the link from the school campus to Bay Shore, Long Island, the administrative offices of the Medical college. The Telex® was on line every hour of the day from the time of the coup until the lines were cut during the rescue mission.

At this point a rumor was started that the amateur radio had been confiscated

Grenada, West Indies

KA2ORK/J3

QSO WITH	DATE	UTC	MHZ	RST	7 DAY
WAZ DNF	25 OCT 83	1130	14	5-9+	208

Mark B. Baretella
St. George's University School of Medicine
P.O. Box 7
Grand Anse Campus
Grenada, West Indies

Ph QSL: Tm
QSL: MGR K2DRA

Steve
Thanks for the help during the
Summer of 83 - Mark

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because of the coup. That would explain the absence of the radio to all who had seen it in Mark's room. The rumor was so successful that Don, J37AH, Steve, N2DRA, and Fred, KC2PK in the States believed it. Don kept Mark's schedules for him, and told the folks up north that the radio had disappeared. From then on, a constant nightly contact was kept between Steve, Fred, and Don. Information was passed to Mark's family as to when he would be able to operate from the campus. When he did, he would operate QRP so as not to interfere with the short-wave receivers that many of the students owned throughout the dorm.

On Sunday, October 23rd, Radio Free Grenada announced an invasion. It was perceived on campus that the announcement was made just to unify the country after the coup. A similar announcement the year before had resulted in a high state of public support for the government, but no invasion. This announcement was thought of in the same "crying wolf" terms. On Monday night the 24th at 1 a.m., Mark went to bed after discussion with friends on whether to leave the island or remain. The question in everyone's mind was whether or not the government might contemplate taking the students hostage as was done in Iran. The answer would come within the next two hours.

At this point, over the horizon came the aircraft carrier *Independence*, her 100 aircraft, 1800 Marines, Army rangers on the Attack Helicopter carrier *Guam*, and about a dozen escort vessels, including two light cruisers and half a dozen destroyers. The show was on! By 3 a.m., reconnaissance aircraft from *Independence* and the staging point on Barbados were looking over the island. However, due to the noise of the air conditioners, no one inside the dorm could hear the activity. Three a.m. arrives, and suddenly the Telex® and telephone lines are cut. A worried administration calls for what they now see as the only possible link to the outside world. The word goes out "Wake Mark." For another two hours, the rest of the campus slept unaware of the problem while Mark set up faster than any field day ever, and thought about exactly what he would say to the world. For the first try, an "emergency CQ" to stateside was tried on 20. The band was absolutely



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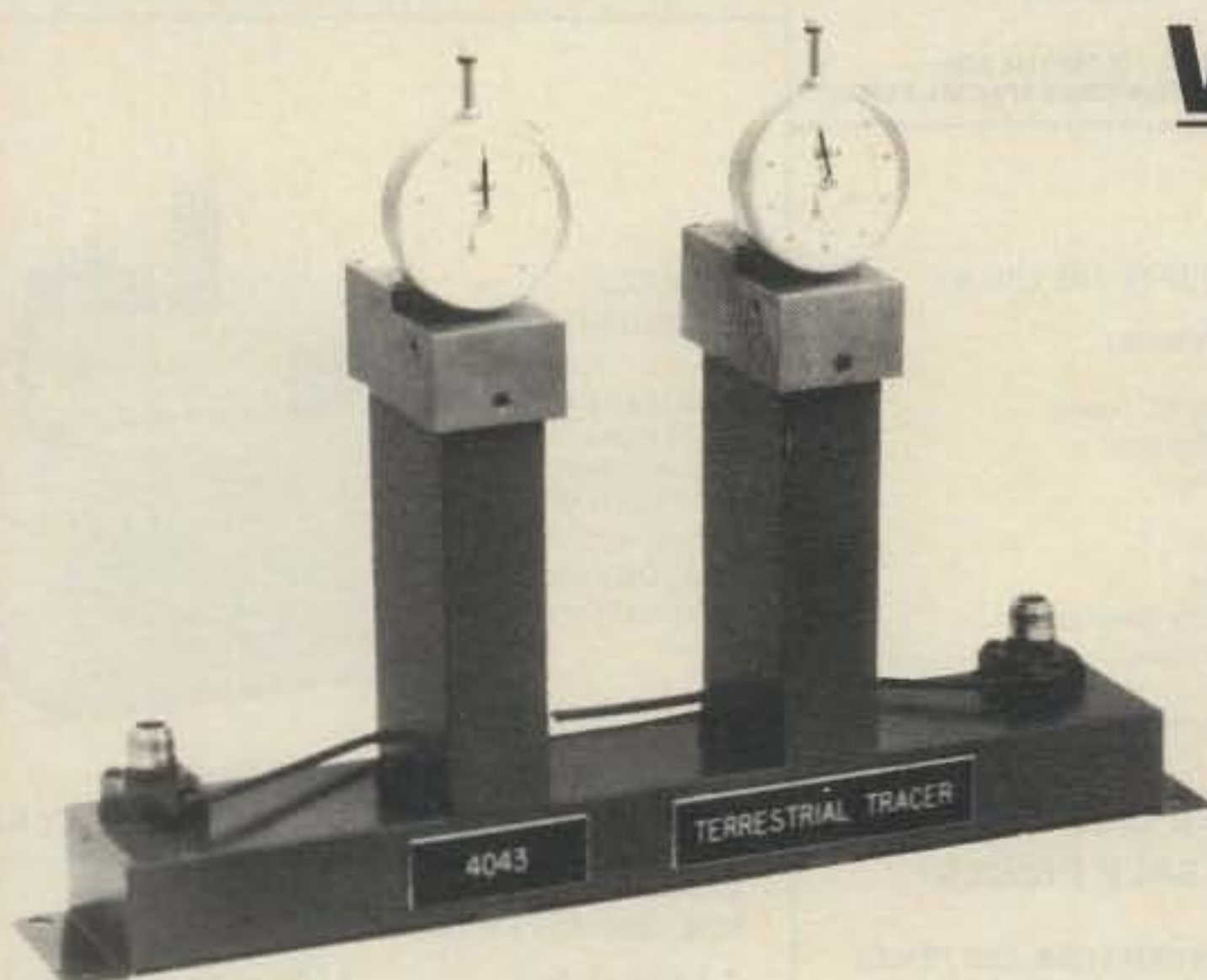
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dead! Now for the first time Mark tried 40. He broke into the only QSO he heard on the band. Mark thinks that he surprised Jim, W4BKK, in Georgia completely with his wild sounding story of an invasion. After some heavy skepticism, however, Jim was convinced to place a collect call to Steve in Montclair, NJ.

Steve thanked Jim for calling, and then clad only in his pajamas, ran outside and connected 40 meter dipole. At 5:15 a.m. Steve still remembers stringing coax. What Mark now had to say really alarmed Steve. "Telex down, phone down, planes over island, and anti-aircraft fire starting to be heard around the island. Steve at once called the State Department's Grenada Task Force, now renamed "The Grenada Working Group." After the coup, Steve had called the State Department seeking information, and was told that the Working Group had all of the information he would need when the time came. When the invasion came, and Steve called, they said "thank you for the information" and gave no information. Steve then called Fred Jacobs at 6 a.m., and Fred joined the group on 40. At 6:15 a.m. it was decided that Steve would call all three television networks and ask about the invasion. They knew nothing, but CBS agreed to check with one or two amateurs that worked for that network. It was now 6:30 a.m., and with band conditions changing and more flights coming over and drawing anti-aircraft fire, it was decided to switch to 14.250. At this point the world started to wake up and tune in.

The QSO established on 40 meters that morning was to go through several bands. For the next two days they would stay in constant communication via amateur radio, the only information channel out of the island.

By now the invasion was in full force. Marines and Rangers were in the process of taking the Point Salinas airport and the commercial airport north of St. Georges. For the students it meant constant buzzing by jets from the aircraft carrier, anti-aircraft fire from the Grenadian army and Cuban "construction workers," and general fear. For Mark it meant staying in his room on the second floor and staying under the table and talking on his radio. For the administration, it meant calming the students and other Americans who had made their way to the campus, and consolidating the students into a single building.

Contact was maintained through Fred with the State Department, and Steve acted as net control. The appearance of a helicopter from the USS *Guam* was greeted with cheers from the students and heavy anti-aircraft fire from the area immediately surrounding the campus.

For the next few hours, 14.250 was used as an outgoing information channel from the school. It would remain this way until about 10 a.m. when conditions, once again, started to shift. Then it was up to

21.303 and more listening and waiting. Even though the Telex® and telephone lines going off of the island had been cut, the phone line between the Grand Anse and True Blue campus remained functional. Suddenly this phone rang, and a surprised student found himself talking to a Ranger officer. All instructions, including the evacuation ones, would come over this phone.

For the world's press this was a difficult period. Most other wars and invasions had been covered, but now they found themselves confined to listening to everything coming out of the war zone via amateur radio. Within hours every radio station, television station, and newspaper in the world found an amateur in their organization and sent him or her home with a reporter and camera crew. Not since the launching of Sputnik in the late 1950's had the public been so focused on amateur radio. Millions of words of explanation could be found in late evening editions of newspapers.

Don Atkinson had gone up frequency by that time, and as amateurs asked questions of Mark, they, in turn, were asked to QSY to Don's frequency for answers. Questions asked by the amateurs of what was going on were answered by Don, and his answers would turn up on late evening news. Suddenly the amateur who tried to get Field Day information into his local paper and couldn't find those same reporters camped out on his doorstep. An international story had a "local flavor" everywhere. The amount of favorable publicity generated for amateur radio was unbelievable.

Back at the campus, the students had set up spotters on the roof, and as developments warranted, they would report what they were seeing over Mark's radio. Helicopter downings, casualty reports from the fighting, and anti-aircraft firing were all reported—and in some cases heard—over the radio.

By 7 p.m. the group had returned to 20 meters after 15 closed down, and found that the QRM was worse than their signals could handle. A request was made through Fred to the State Department for permission to operate below the band edge, and permission was granted by the FCC in Washington. This information was given to Fred by Mr. Reed Clark of the State Department. Down to 14.140 MHz they went, only to find that they had stumbled on the Canadian National Emergency Frequency. So up to 14.351 they went. Operations were again possible.

For Mark, sunset meant a few hours to sleep, so he slept while "Mark 2," his roommate, operated the radio. Four hours later KA2ORK awoke rested and refreshed, and continued operating.

The next day was more of the same, and those activities were reported faithfully by amateur radio and the press. Around 5 p.m. the actual rescue took place on the Grand Anse campus, and

Mark's own words tell of the tenseness of the situation.

"Evacuation was a whirlwind of confusion. The military were very, very controlled. They must have rehearsed for this one. We had been told on the phone to put all of the students into five rooms on the first floor, doors closed, lying face down and wait. We would know when they arrived because they would identify themselves as U.S. soldiers, and would tell us where to go from there. My roommate Mark and I had decided to operate to the last possible second to try and get any information out that was necessary. At the last second, as the helicopters began to approach the beach, someone came upstairs and said 'get out, you have to get out now!' We disassembled our equipment, turned the backup generator off, and the mortars started hitting the beach trying to keep the helicopters from landing. The mortar fire was heavy with the shells going over the campus to the beach area outside our back door. It was very loud and close. We put the radio in a piece of luggage, and ran, under fire, down the stairs, and were told which room to get into. We were told to drop the luggage, and then flown to Point Salinas Airport, put on an Air Force C-130, and flown to Barbados. During the stop, Mark called home, his parents first indication that he had been rescued.

On arrival at Norton Air Force Base, he met the next great mob, the media. Then they were briefed on how to buy their tickets to return home. No clothes, no wallet, and now, only a promise of payment got many of the students home. From there it was off to Newark, N.J., to meet the media, parents, and receive a Citizenship Award, "Mark Barettella Day," a trip to the White House, and a chance to meet the President.

But now its back to a temporary college, and an attempt to get life back together and earn enough to buy some new gear. Some of the students may go back to Grenada, but for Mark it's college life at various universities in the states until he can once again sign J8 at Kingstown Medical college in St. Vincent.

Postscript

Mark's been surprised by all of the attention he's been getting—the media coverage and the chance to meet the President. He's been deluged by offers to speak and appear at numerous events and programs. Mark's kept his perspective and his feet firmly on the ground and is anxious to resume his studies of medicine. One sad note to report is that Mark's rig had to be left behind in the rush and was stolen perhaps as a souvenir. I'm glad to report that through the generous cooperation of ICOM, a brand new IC-720 and power supply will be accompanying Mark when he returns to school. I hope to have pictures of the presentation next month.
—K2EEK

Although we all want gear in "mint" condition, there's hardly an amateur around who hasn't tried his hand at modifying some rig or another. It is possible to build a better mousetrap and to improve just about anything as K2MGA proves.

More Convenient Mode Switching For The ETO Alpha 78 Linear

BY RICHARD A. ROSS*, K2MGA

Far be it from me to question Dick Erhorne at ETO. After all, he is the man behind those lovely Alpha amplifiers, one of which occupies a corner of the operating desk at K2MGA. But after recently replacing the old Collins 30L-1 with the Alpha 78, I began puzzling over the switching interconnections between the Alpha and the S-Line. It seems that to get the S-Line to properly activate the Alpha on s.s.b. and to get the Alpha to key the 32S-3 on c.w. required either switching a few phono patch cards or using an external d.p.d.t. switch to switch from c.w. to s.s.b.

Why, I asked, was it necessary to add an external switch to accomplish the mode change function on an amplifier as sophisticated as the Alpha 78? The answer lay in the very sophisticated design of the Alpha's QSK system. Some rigs' relays simply don't switch in proper sequence or rapidly enough to satisfy the "fail safe" T-R switching system in the Alpha 78 on both modes. Hence the external switch.

But the use of the additional switch was a pain in the neck (one more thing to forget to switch when changing modes), and a method was sought to effect the necessary wiring changes automatically by means of the CW/SSB/Standby push-button switches on the front panel of the '78. The result is illustrated in fig. 1.

No holes need be drilled in the Alpha 78, nor do any significant wiring changes need to be made. The entire modification can be installed in about one hour, and the unit can be restored to original in about half that time should it ever become necessary. Basically, all that is done is to use two series-connected miniature 12 v.d.c. s.p.d.t. relays from Radio Shack to yield the equivalent of a d.p.d.t.

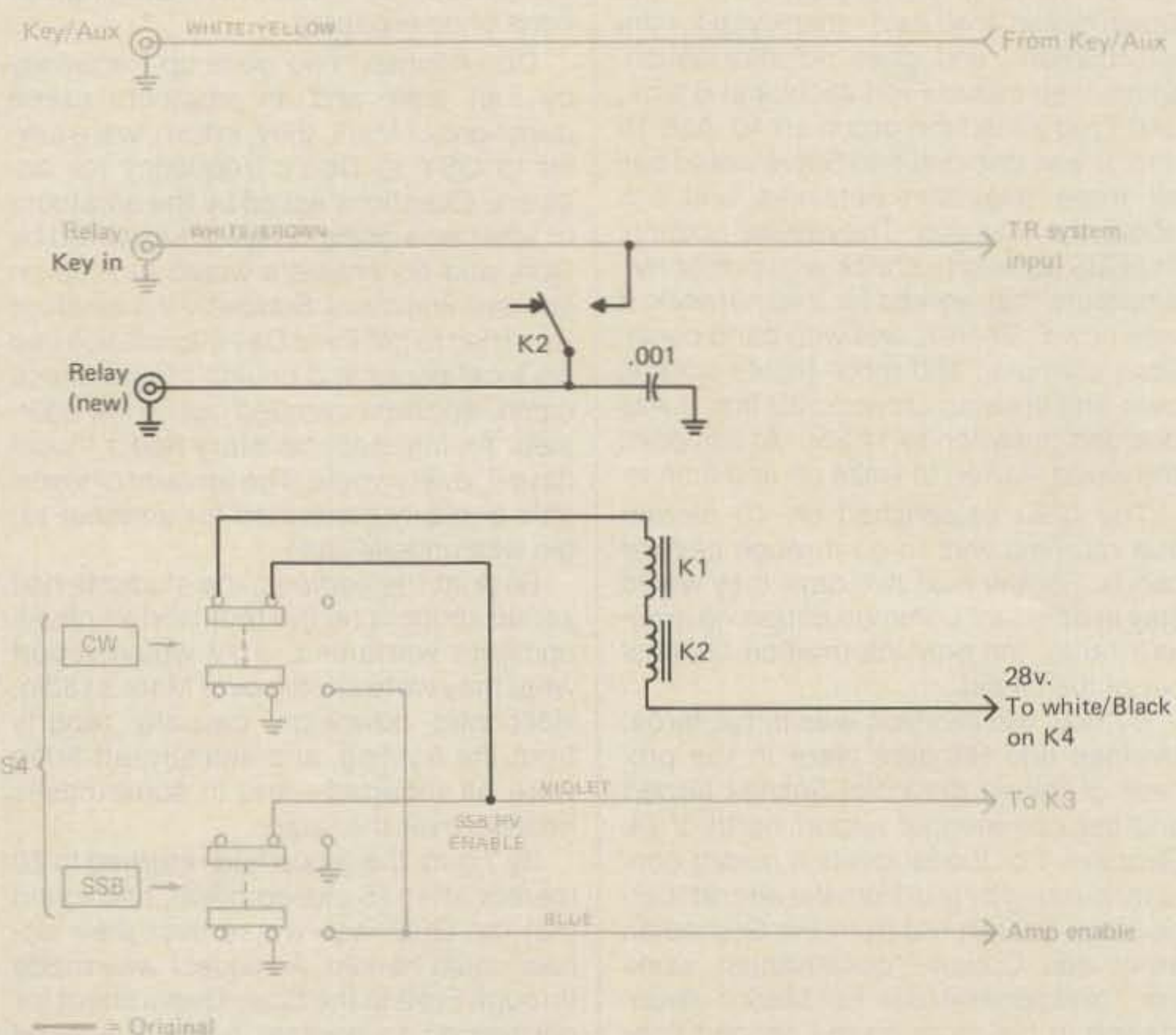


Fig. 1—The simple modifications necessary to add complete mode versatility to the ETO Alpha 78 linear amplifier.

24 v.d.c. relay which is activated by pressing the s.s.b. button on the Alpha. The new relay's coil is wired in parallel with the coil of K3, the Plate Voltage relay which selects the 1750v. tap on the plate transformer for s.s.b. operation, and when de-energized, selects an 1100v. tap for c.w. use.

One additional phono jack is needed in this hookup, and a single-hole-mount type from Radio Shack was neatly secured in one end of a ventilating slot on the rear

panel of the Alpha 78 more or less midway between J3 and J8, the two existing jacks, as shown in fig. 2. The two relays are most conveniently mounted by double-sided tape to the inside top of the rear panel near the control-circuit jacks. Naturally, I had no double-sided tape on hand and wanted to complete the no-holes mod on Palm Sunday afternoon when every store in town was locked up tight. To the rescue came a pair of 3M® self-adhesive rubber feet and a few dabs of

*Publisher, CQ

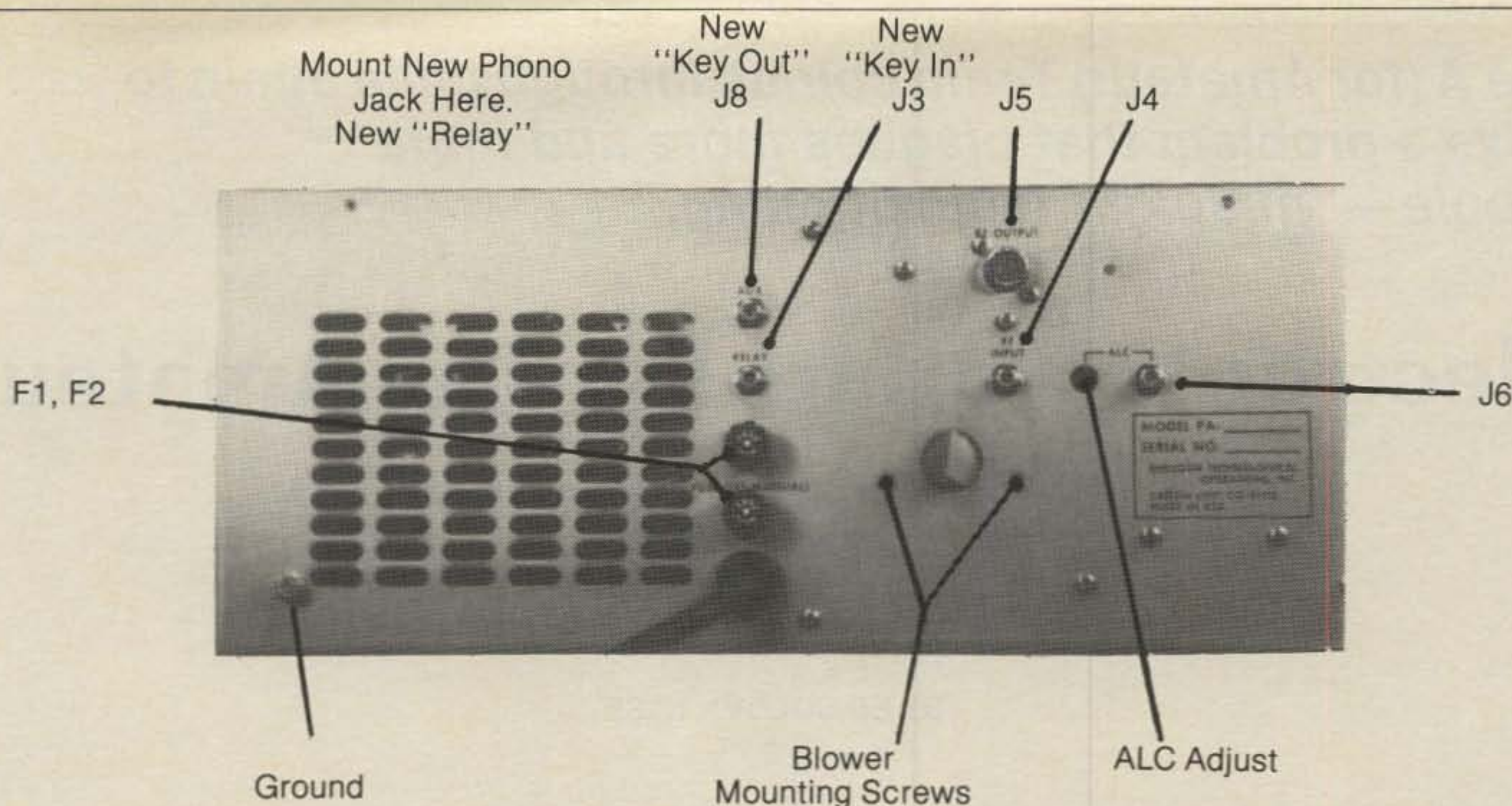


Fig. 2—Rear view of the Alpha 78 linear. The new phone jack, single-hole mounting, is mounted in the second ventilating slot down from the top in the extreme right column of slots. This places it between J8 and J3.

silicone bathtub caulk. One rubber foot was cemented to the top of each relay case. When dry, the peel-off paper was removed from each foot and the relays pressed in place securely on the inside of the rear panel. For convenience in routing the one long hookup wire from S4, the CW/SSB/Standby switch, to the rear-mounted relays, the plate transformer was removed, which also made life quite a bit easier when wiring and rewiring the relays and jacks. Only one original wire is cut, and that's the white/yellow wire to J8, which is snipped off at J8 and connected to the relay as shown. To restore the unit to original, simply remove all the added wiring, replace the white/yellow wire to J8, remove the new phone jack, and peel off the relays.

The functions of the three phono connectors are more clearly indicated as shown in fig. 1. The +28 v.d.c. buss to power the new relays is most conveniently tapped into by running a short piece of hookup wire from the new relay coil, across the center shield in the small bending notch at the top rear, and tack-soldering the wire onto the coil terminal of reed relay K4 just inside the r.f. compartment. The correct terminal is the one bearing two white/black wires, *not* the one bearing the white/gray wires. This new wire should be dressed carefully to prevent pinching when the top cover is replaced. The lead from S4 to the new relays should be dressed carefully along with the cable harness inside the lower front panel and along the center shield to keep it clear of all high-voltage wiring.

In use, pressing the desired mode button on the Alpha 78 sets up the switching most appropriate for that mode. Note that pressing both mode buttons simultane-

ously and locking both of them "in" will apply the higher s.s.b. plate voltage to the finals, but will keep the amplifier switching set up for c.w. This practice is not recommended by Alpha, but it works flawlessly.

Is it worth \$7.00 in parts and an hour's work to eliminate the external switch? Well, considering that it is now possible to plug-connect the Alpha 78 to any rig on the market without any jury-rigging whatsoever, I'd say it's a good investment of time and money.

It should be noted that the two-year warranty offered by ETO on Alpha amplifiers will not be voided by the modifications described here provided that the work is done neatly. In the event that a modified amplifier must be returned to ETO for either in-warranty or out-of-warranty service, the ETO service department requests that information be included describing any modification and its function in order to minimize the technician's detective work. You know what mods you've made; he doesn't.

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CIRCLE 62 ON READER SERVICE CARD

The A (for Amateur) Team comes through once again to solve a problem that plagues more and more people—"midnight requisitioning."

Electronic Warfare For The Amateur

A Low-Cost Alarm System You Can Build Yourself

BY ED SOLOV*, K2SE

Recent "guerilla" attacks on my home QTH by neighborhood (human?) predators led me to devise a very simple (and, of course, cheap) solid-state alarm circuit to employ as a form of electronic warfare. This design allows the use of multiple normally closed circuits with any convenient 12 v.d.c. sounding device, such as a car horn, loud 12 v. bell, or siren. Although I use mine at home and power it with a 12 v. power supply, it is equally useful in a car powered by the car's own 12 v. electrical system.

Circuit Operation

As shown in fig. 1, the switching device used is an SCR, which can be bought for 99¢ at Radio Shack. The gate lead of the SCR is connected through a number of parallel diode and resistor circuits to the 12 v. supply. As long as the point connecting the diode to the resistor in each of these circuits remains grounded, no gate current flows in the SCR and silence prevails. If, however, any of these becomes ungrounded, even momentarily, gate current flows, the SCR turns on, and raucous noise results. Regrounding that point does not cut off the noise, because once it is switched on, an SCR no longer needs gate current to stay on; it latches on. To turn it off, you must interrupt the anode current (i.e., you must reset it).

You can build any reasonable number of resistor-diode paths into the circuit (I used four in my alarm). Each of these circuits gives you an independent sensing capability. For the alarm to be silent, the diode/resistor connection in each and every one must be grounded, but more about this later. The sensing aspect of the circuit is accomplished by routing a

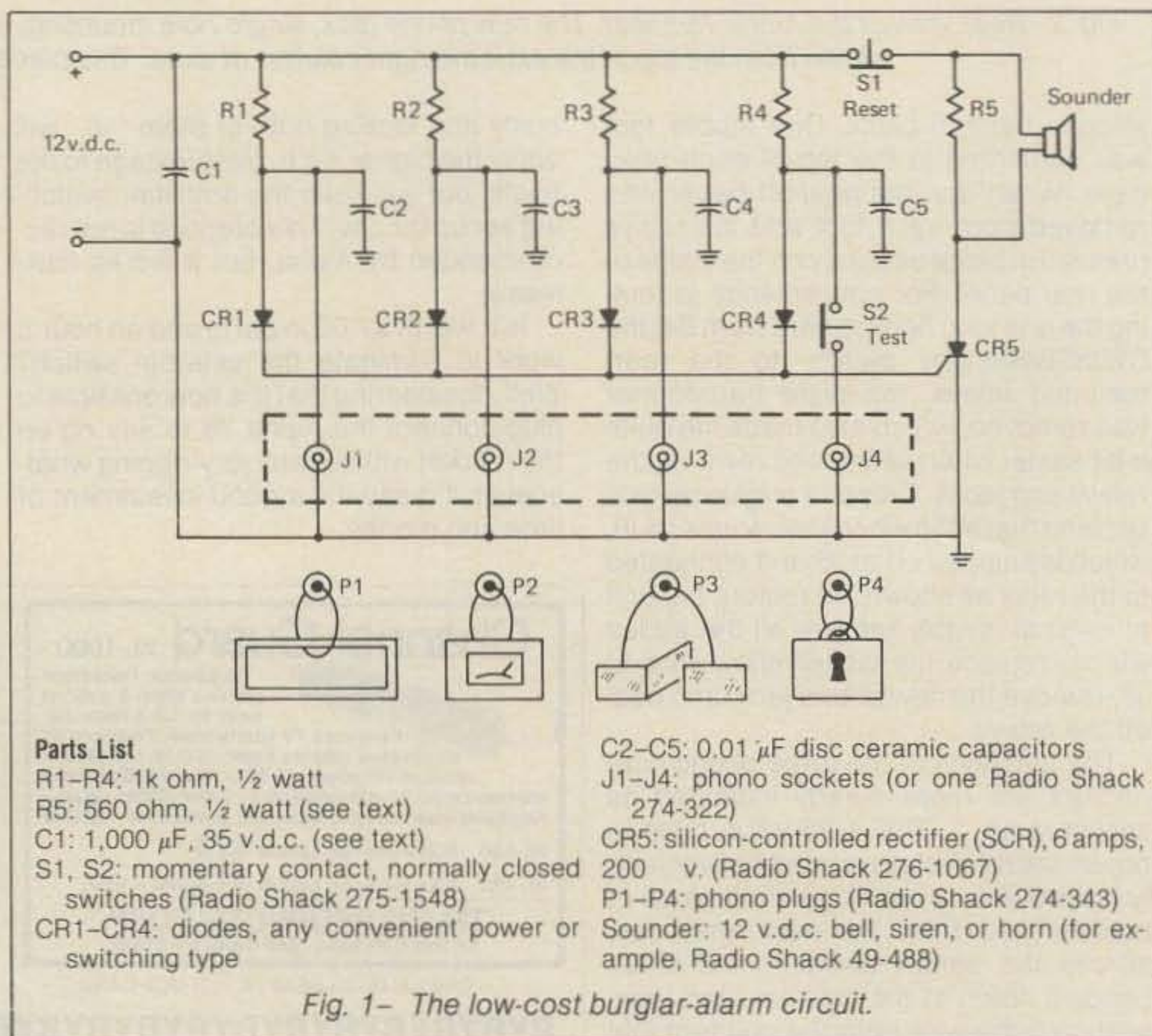


Fig. 1- The low-cost burglar-alarm circuit.

wire—or other conductor—from the circuit's key point through or around that which is to be protected, and then back to circuit ground. If a thief tries to remove the object of your protection, he will break the circuit, thereby ungrounding that key point and setting off the alarm.

More About The Circuit

I chose to use a dual-sound siren (available from Radio Shack for about \$20) as the noise-maker. It works well and is very loud. I did, however, find two problems in tying it through my alarm to my power

supply. First, it would not reliably sound when connected to the power supply, but it *would* always work on a battery. That was a head scratcher. It turned out that although it is supposed to draw 0.75 amps, it apparently does so only on an average, and it asks for a lot more upon starting. The power supply generally could not start it. I cured that problem by connecting a big (in my case 1,000 μ f) 35 volt capacitor across the supply.

Next, I found that the sound would not continue once started. I theorized that the current in the siren was dropping to

*247 Andover Drive, Wayne, NJ 07470

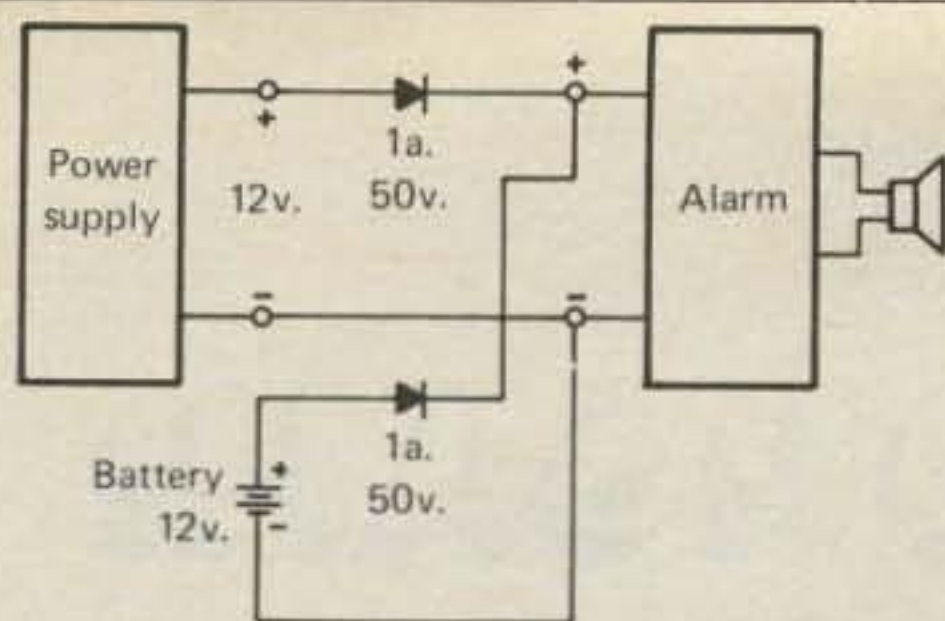


Fig. 2— A battery back-up circuit ensures continued protection.

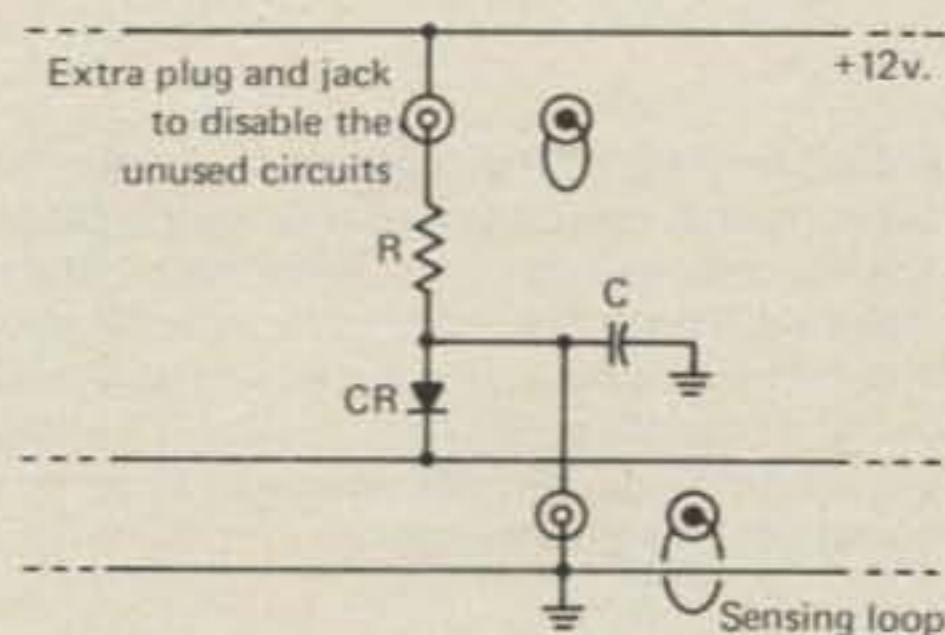


Fig. 3— How to disable unused circuits.

zero at some points in its "whooping" cycle, allowing the SCR to shut off. To make sure it would stay on, I connected a 560 ohm, 1/2 watt resistor across the siren. That took care of that.

When I got the whole thing up and working, I tested the circuit by connecting the sensing circuit through a short test grounding loop, and all was well. I then installed the alarm and connected it through a rather long sensing loop to my outdoor portable barbecue (which I had just bought to replace the one that the thieves made off with). Although the loop was a nice d.c. short, the alarm would trip after a few seconds in this configuration. I figured that the long loop was acting as an antenna, picking up r.f., and tripping the alarm. (See, this article *does* have to do with radio after all!) To cure the problem, I bypassed the sensing loop at the connector with a 0.01 μ F disc ceramic capacitor.

Power

For my application, a 12 v. power supply was used. The circuit will work just as well on a 12 v. battery (such as a lantern battery or a car battery). The best of all worlds is to use both—a battery backup. That can be added as shown in fig. 2.

Construction

I built my alarm on perfboard, which I mounted inside a plastic box. I included a test switch in one of the sensing legs (which momentarily ungrounds the sensing point) and a reset switch to shut off the alarm after order has been restored. (If an on/off switch is used, this reset switch is not needed.)

The diodes in the sensing circuits can be almost anything. They carry only

about 12 ma each, and they block only very low voltages.

I used inexpensive phono plugs and jacks for the connectors; they, too, do only light duty.

Every one of the sensing circuits actually used must be grounded or the alarm will trip. A short grounding loop can be connected to each unused circuit, or a switch can be connected in series with each resistor/diode pair. My choice was to keep cost down by using an extra shorted phono plug to enable, as required, each of the sensing circuits, as shown in fig. 3.

Mobile Use

Although I have not used my alarm in a mobile application, it would do nicely there. The cost of the sounder could be saved by using the car horn, if desired, and the car comes complete with its own 12 v. supply. To protect a rig, it is only necessary to connect the sensing point of one of the sensing circuits to the chassis of the rig, as ground is already provided by the connection of the rig to the car electrical system (see fig. 4). A second sensing pair could be used for the stereo or tape player; a third could be creatively

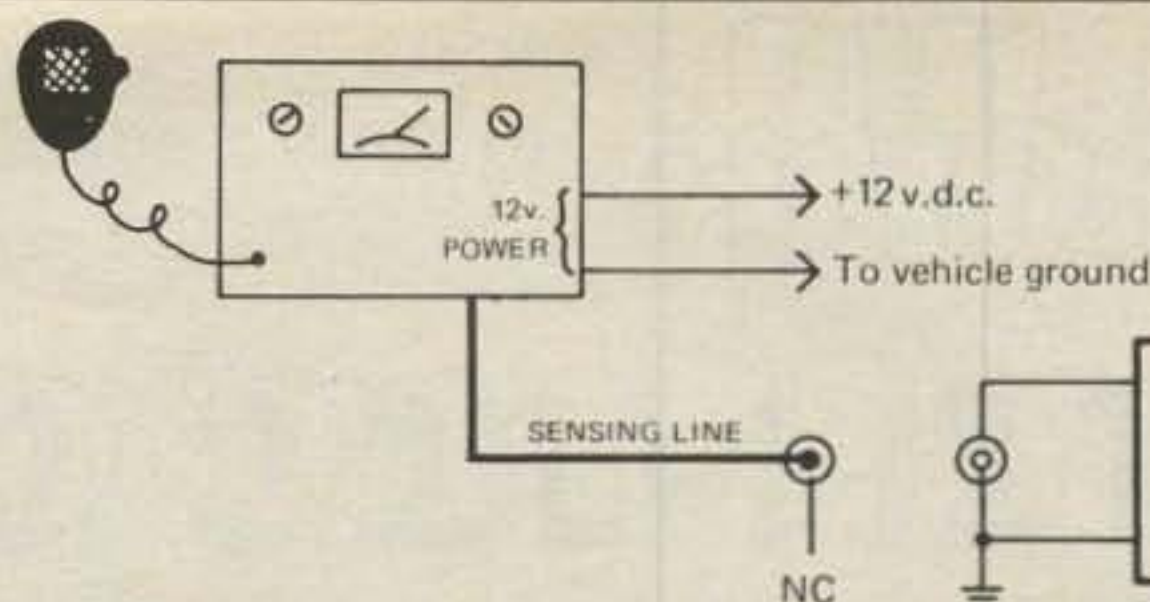
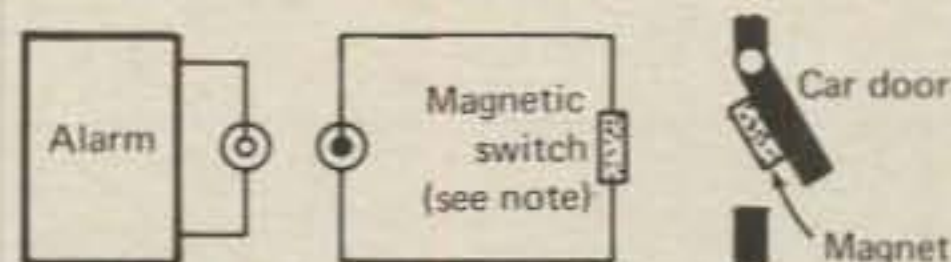


Fig. 4— How to protect a piece of amateur gear using this system.



NOTE:
Closed circuit with magnet engaged—
such as Radio Shack #49-495

Fig. 5— How to connect the system to a car door.

wired to a door or hood (see fig. 5), and so on. Disconnecting or cutting any power lead or sensor lead will trip the alarm; again, once tripped, the alarm will continue to sound until you reset it. Of course, the alarm itself and the reset button should be well hidden, well disguised, or otherwise protected.

When the Alarm Trips

If the alarm goes off, the perpetrators hopefully will be scared away, leaving your goodies intact. Simply press the reset button; the alarm will become quiet and will again be ready. If, however, you catch the bad guys at it, you may have a real problem, but that's beyond the scope of this article.

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THE TEN-TEC CORSAIR TRANSCIVER



The Corsair sports some brand-new Ten-Tec equipment styling.

cludes forward PEP power and s.w.r., and the power output can be varied over a wide range. Speech processing is not mentioned, but it is included. The 100% duty-cycle specification is quite interesting in that it is achieved without the use of any cooling fan! The controls, indicators, and connections available cover just about any imaginable operating requirement.

Circuit

The basic block diagram of the Corsair is shown in fig. 1. Basically it is a single conversion circuit using a 9 MHz i.f., but with an additional down/up frequency conversion to 6.3 MHz to provide a passband tuning feature.

The PTO feeds a variable 5.0 to 5.5 MHz signal into the "Osc./Mixer" board where that signal is mixed with the output of a crystal oscillator so the signal going into the "RF Mixer" board is correct to work with a 9 MHz i.f. For instance, for operation on 40 meters, 7.0-7.5 MHz, the PTO output frequency is translated to 16.0-16.5 MHz in the "Osc./Mixer" block. In this manner, full 500 kHz coverage is obtained on the 1.8, 3.5, 7.0, 10.0, 14.0, 18.0, 21.0, 24.5, and 28.0 to 30.0 MHz bands (the latter in four 500 kHz ranges). Crystals are included for the 10.0, 18.0, and 24.5 MHz bands, and the Corsair is ready to go on those bands. A few bonus features are that the PTO range actually has about a 30-40 kHz overrun on band edges so many MARS fre-

Have the boys at Tennessee Technology come up with another winner in their new Corsair transceiver? Well, only time will tell. However, they certainly have come up with a very interesting transceiver.

To start with, the Corsair has a bright, new styling as compared to some former Ten-Tec products. It is not that the basic color scheme used has changed much, but the dark-out plexiglass panel over the meter and digital frequency display, the placement and grouping of the controls and switches, the changed trim scheme, etc., all indicate that Ten-Tec took a hard look at the packaging of their new top-of-the-line transceiver. The result is a very "smartly" designed unit that really can only be appreciated by seeing it. It is also an amazingly light-weight and compact unit (14 lbs. in a 15" x 14" x 5" package).

General Characteristics

The Corsair is a 100 watt output class transceiver designed for c.w., s.s.b., RTTY, and SSTV operation on all existing and proposed amateur bands. Detailed specifications for the unit are shown in Table I. As one glances through the specifications, one will note quite a few interesting features, some of which will be covered in more detail later. For instance, on receive the r.f. preamplifier can be switched in or out, there is 2.4 kHz 12-pole crystal-ladder s.s.b. filtering, various optional

s.s.b. and c.w. filters, passband tuning, selectable a.g.c., 6-digit frequency readout, notch filter, noise blanker with adjustable threshold, RIT, and a good dynamic-range specification.

On transmit, 85-100 watts of output power are available, full break-in operation is provided on c.w. with sidetone, the metering in-



Although the Corsair has new styling, it fits in nicely with other Ten-Tec equipment in this station setup. (The Hercules solid-state linear is below it and the Model 229 tuner is to the right.)

*c/o CQ Magazine

quencies are covered, the 1.8 MHz band extends to 2.3 MHz to cover part of the Marine band, and the 10 MHz band includes, of course, WWV.

In the receive mode, incoming signals are routed through the lowpass filter assembly required for the PA stage (a five-pole filter on each band), via a PIN diode circuit for input signal switching to the bandpass filter board and then to a 2N3866 r.f. amplifier stage. This stage is shown in more detail in fig. 2. It is interesting in that it is completely broadband with no tuning required. In fact, the only "tuning" associated with the Corsair is the main tuning. After amplification, the signal is routed to a double-balanced diode quad mixer on the same board for translation to the 9 MHz i.f. The board also contains a low-noise i.f. preamplifier. The following noise-blanker stage is inserted in the i.f. path ahead of any high-selectivity crystal filter stages. The noise-blanker stage splits the incoming signal into two paths,

one for gating and one for noise detection. Detection of fast-rise spike-type noise pulses causes the gating circuitry essentially to instantaneously interrupt the i.f. signal flow. The initial selectivity is provided by a standard 4-pole 2.4 kHz s.s.b. filter. If desired, this filter can be replaced by an optional 8-pole crystal filter.

The signal is next routed to a passband tuning board as shown in fig. 3. The feature is neatly executed. Q3 is the local oscillator, and its nominal 15.3 MHz crystal-controlled frequency can be shifted plus or minus a few kHz by controlling D17, an MV209 varactor diode. The incoming 9 MHz signal is translated to 6.3 MHz, goes through one of the crystal filter blocks (labeled 2.4, 1.8, .5, and .25), and then is retranslated to 9 MHz in the output stage Q2. By varying the frequency of the 15.3 MHz oscillator, the passband of the crystal filter on the board is moved across that of the preceding 2.4 kHz filter. The standard 2.4 kHz s.s.b.

General

Frequency Coverage: 1.8-2.3, 3.5-4.0, 7.0-7.5, 10.0-10.5, 14.0-14.5, 18.0-18.5, 21.0-21.5, 24.0-24.5, 28.0-30.0 MHz transceive. (V.F.O. provides approximately 40 kHz overrun on each band edge.)

V.F.O. Stability: Less than 15 Hz change per F° averaged over a 40° change from 70° to 110° F after 30 minutes of warmup. Less than 10 Hz change from 105 to 125 v.a.c. line voltage when using a Ten-Tec power supply.

Tuning Rate: Vernier, 18 kHz per revolution, typical.

Readout: 6 digit, 0.3" LED numerals.

Accuracy: ± 100 Hz.

Semi-Conductors: 1 LSI, 20 IC's, 94 transistors, 107 diodes, 6 LED readouts.

PC Boards: 22 PC assemblies with plug-in cables.

Construction: Rigid aluminum chassis. Dark painted aluminum front and rear panels, textured top and bottom. Snap-up, steel bail.

Power Required: 12-14 v.d.c., 850 mA receive, 18.5 A max transmit.

Dimensions: HWD $5\frac{1}{4}'' \times 15'' \times 14''$ ($13 \times 38 \times 36$ cm), bail retracted.

Net Weight: 14 lbs. (6.4 kg).

Receiver

Sensitivity: $0.25 \mu V$ for 10 dB S + N/N, all bands. $0.8 \mu V$ typical with r.f. amplifier off.

Selectivity: 12-pole crystal ladder filtering. 2.4 kHz bandwidth, 1.7 to 1 shape factor at 6/60 dB. Three-position switch selects standard s.s.b. filter, optional 1.8 kHz s.s.b. filter, 500 Hz c.w. filter, or 250 Hz c.w. filter.

Notch Filter: Greater than 50 dB notch tunable between 200 Hz and 3.5 kHz.

C.W. Spot: With 750 Hz reference tone.

I.F. Frequencies: 9 MHz and 6.3 MHz.

Antenna Input: Low impedance, unbalanced.

Audio Output: 1 watt @ 8 ohms with less than 2% distortion. Built-in speaker.

Spurious Responses: All below equivalent 10 dB S + N/N signal except 1.838 MHz (less than 15 dB S + N/N), 21,300 MHz (less than 20 dB S - N/N), and 28,980 MHz (which can be eliminated by using low end of 29.0-29.5 MHz band segment).

Noise Blanker: Built-in, adjustable blanking threshold.

I.F. Rejection: Greater than 60 dB.

S-Meter: Automatically switched on when receiving. Calibrated to $50 \mu V$ at S9, ± 3 dB.

Dynamic Range: 90 dB, typical.

Offset Tuning: Dual range, max. ± 4 kHz; min. ± 500 Hz, typical.

Transmitter

D.C. Power Input: Maximum 200 watts @ 14 v.d.c. c.w. and s.s.b. 100% duty cycle for up to 20 minutes.

R.F. Power Output: 85-100 watts, typical.

Output Impedance: 50 ohms, unbalanced.

Microphone Input: High impedance. Accepts high- or low-impedance microphones with 5 mV output. Polarizing voltage available for electrets.

T/R Switching: VOX or PTT on s.s.b. Instant break-in or semi-break-in on c.w.

C.W. Sidetone: Internally generated. Adjustable tone and volume independent of a.f. gain control. Operates only in c.w. mode.

S.S.B. Generation: 9 MHz, 4-pole crystal ladder filter. Balanced modulator.

Carrier Suppression: 60 dB typical.

Unwanted Sideband Suppression: 45 dB typical at 1.5 kHz tone.

Spurious Output: Better than -45 dB relative to full output.

Meter: Forward power, collector current, s.w.r., processing level. Selectable 4-position switch.

C.W. Offset: 750 Hz, automatic.

A.L.C. Control: Front-panel adjustable. 30 to 100 watts output, LED indicator.

Front-Panel Connections and Controls

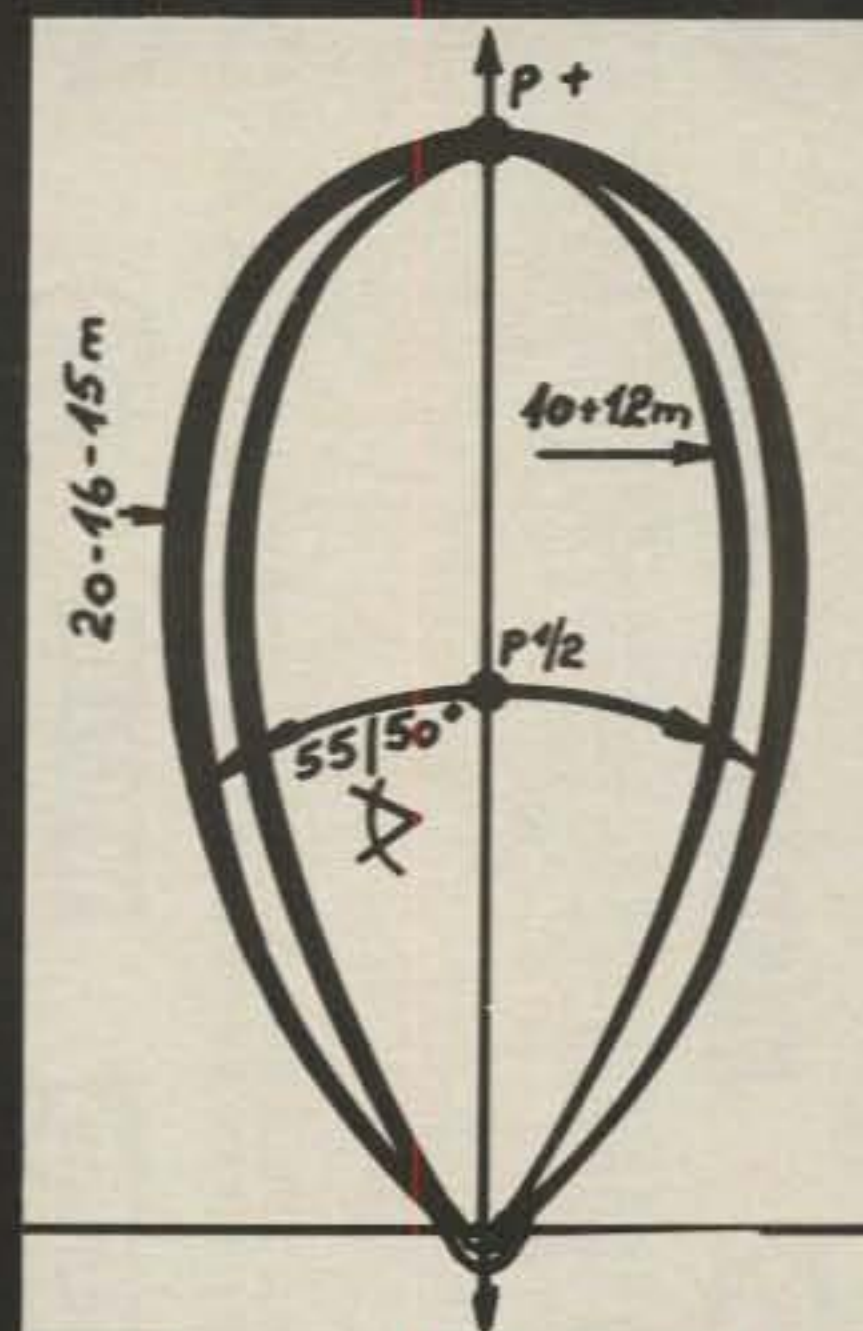
PBT; OFFSET; AF-RF AMP; RF-POWER; NOTCH; DRIVE; Bandswitch; Main Tuning Knob; MODE; METER switch; VOX GAIN; VOX DELAY; PROCESS level; N.B. LEVEL; ALC threshold; QSK/VOX switch; AGC switch; XTAL switch; OFFSET SELECT switches (2); SPOT push-button; PHONES; MIC.

Rear-Panel Connections and Controls

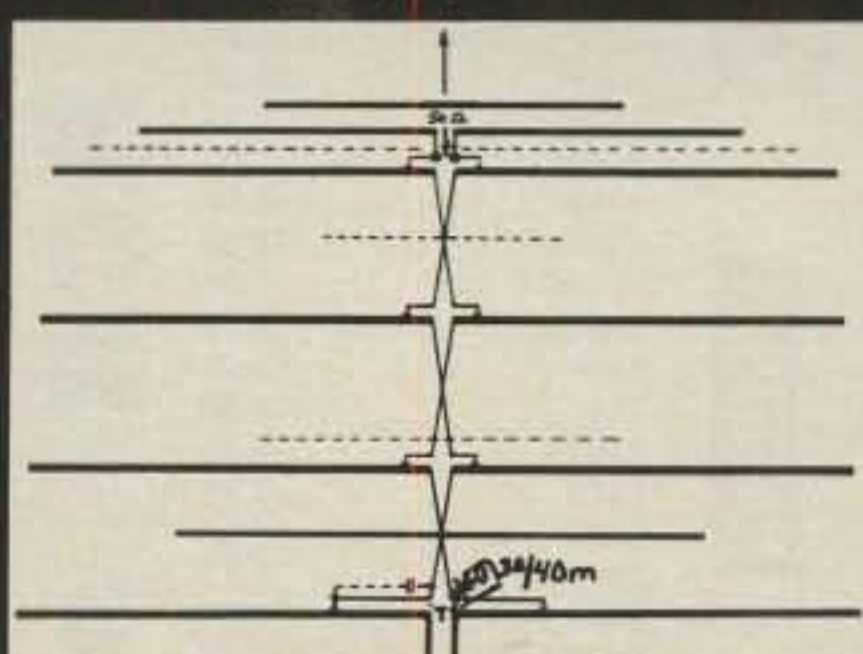
EXT. T/R jack; AUDIO IN jack; AUDIO OUT jack; AUX. 12 VDC jacks (2); KEY jack; PTT jack; VFO IN jack; VFO OUT jack; ACCESSORIES socket; LINEAR socket; GND terminal; EXT. SPKR. jack; POWER socket; 50 OHM ANTENNA connector (SO-239); RX ANTENNA jack; RX-TRX switch.

Table I- Corsair specifications.

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Further details in coming issues of CQ.



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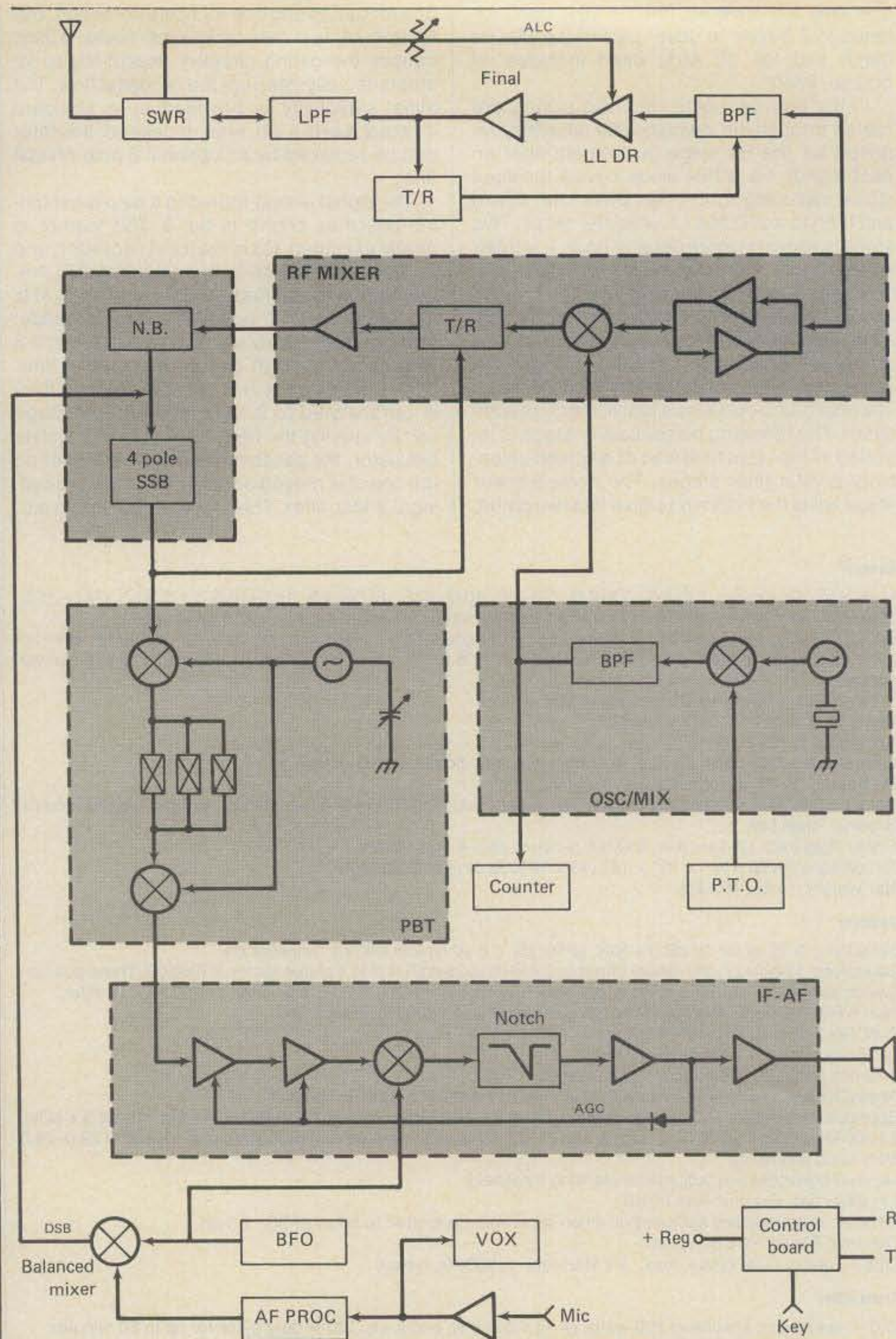


Fig. 1- Corsair block diagram

filter on the passband tuning board has 8 poles, and since it operates in series with the preceding, standard 4-pole filter, the overall result is 12 poles of i.f. filtering. The optional filters which can be placed on the passband tuning board are all diode switched and are preceded by resistor attenuator pads for overall gain equalization when switching between filters. (The .25 kHz filter does not have a pad, since its loss would be the highest that the others have to be equalized to match.)

After the passband tuning stage, the received signal goes through some i.f. amplifier stages and on to a dual-gate MOSFET product detector stage. The demodulated signal is then routed through a notch filter. The notch filter is tunable from 200 to 3500 Hz with a 50-60 dB notch depth. This is a particularly wide range for such a circuit, and details of it are shown in fig. 4. Final audio amplification is via a LM383 IC to produce about 1 watt output

with less than 2% distortion to a built-in speaker. A.g.c., which is of the time delay or "hang" type, is audio derived, so it follows the setting of the audio notch control. The same board, fig. 4, also contains the sidetone oscillator with adjustable pitch and volume and a spotting oscillator. The latter is set at 750 kHz, the same as the i.f. offset on c.w., and can be activated by a front-panel pushbutton. Its tone can be beat against that of a desired c.w. signal for exact zero beat.

In the transmit mode, one can visualize the circuitry as working partially backwards. The microphone signal is amplified and then proceeds to the VOX and a.f. speech processor circuitry as shown in fig. 5. The a.f. processor is interesting in that it consists of a peak clipper and compressor. D11 and D12 perform the clipping function, while transistor Q3 is the shunt element for compression. The processing level can be set by a front-panel control.



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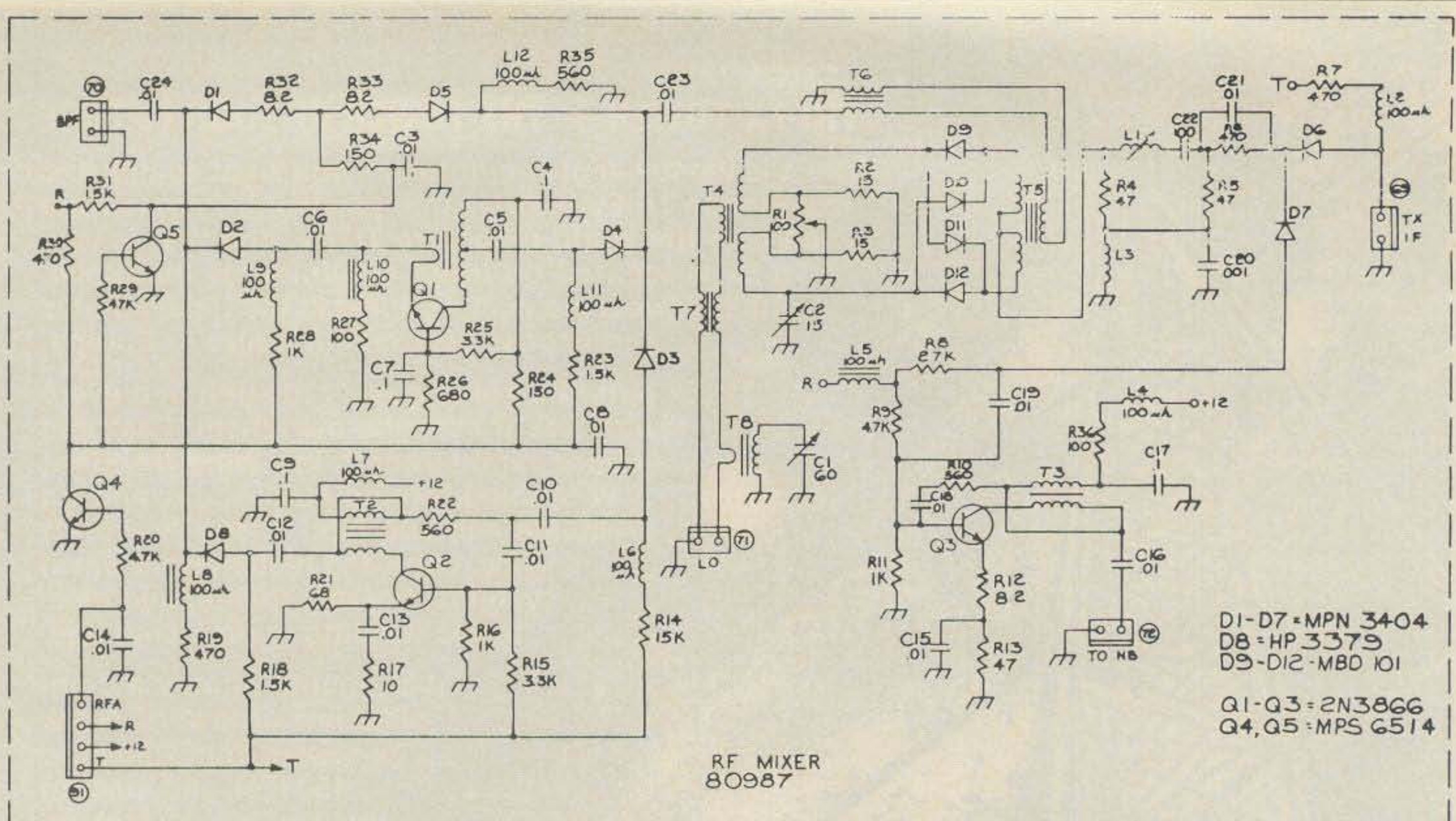


Fig. 2- The first active device in the "front-end" of the Corsair is the r.f. amplifier stage Q2, which is a broadband amplifier. After this stage the received signal goes through a double-balanced mixer and "exits" via Q3, another low-noise amplifier. Diode switching provides for using circuitry on the r.f. mixer board for the receive and transmit signal paths.

Fig. 5 also shows the VOX circuitry, which has front-panel controls for gain and delay.

After the circuitry of fig. 5, the a.f. signal is fed to a balanced modulator and a d.s.b. signal is generated. The d.s.b. signal goes through the standard 2.4 kHz s.s.b. filter and on to the "RF Mixer" block, where it is translated to the final output frequency. The signal is then amplified in various stages until it reaches a pair of MRF-458 transistors which operate in a push-pull arrangement at 200 watts d.c. input on all bands. The PA stage is completely broadband and followed by a lowpass filter assembly and an s.w.r. detection block. The front-panel meter automatically switches between being an "S" meter on receive and a multi-function meter on transmit. The s.w.r. reading function is unique in that there is none of the usual forward "set" adjustment necessary. Also, the forward power meter reading is of the peak-reading type, so it indicates PEP.

The s.w.r. bridge circuitry also supplies an a.l.c. feedback voltage and a control voltage which is used to drive an "ALC" LED which indicates relative output power.

Circuitry that is common to both the receive and transmit functions includes the frequency readout and control circuitry. The frequency readout circuitry basically revolves around an LSI IC, the MOSTEK type MK50398N. It accomplishes all of the counting, latching, multiplexing, output decoding, and driving functions on a single chip. The counter basically reads the "Osc./Mix" board output frequency, but it is fed preset information to convert its output to the actual transmitted or received frequency. It also follows and indicates any frequency offset set by the "Offset" (RIT) control in the receive mode. The actual readout is on large 0.3 inch LED displays with the six-digit display having five red readouts and one green readout for hundreds of Hertz. The control circuitry basically encompasses various

transistor switches for controlling voltages that switch the transistor between the receive and transmit modes. Among other things, it provides for a slow/fast break-in feature on c.w.

Construction

The foregoing, frankly, may sound like a

pretty bland description of any conventional, single-conversion 9 MHz transceiver. However, it was meant just to set the groundwork so one can visualize the basic makeup of the Corsair. So, what makes the Corsair different? In one sentence it could be expressed as "innovative and honest execution of a basically proven transceiver design concept using ex-

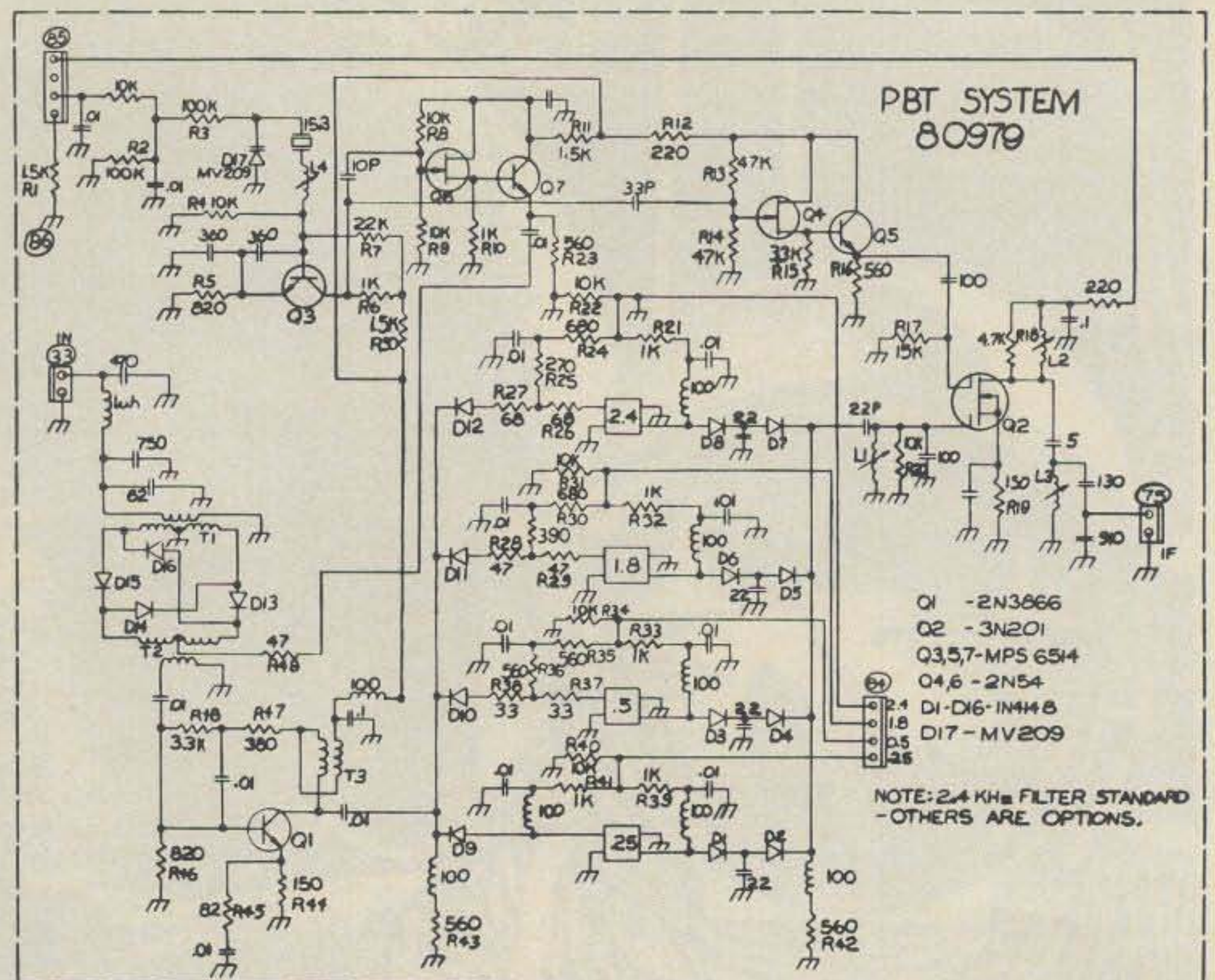


Fig. 3- The passband tuning system is neatly contained on one circuit board, except, of course, for the front-panel potentiometer which controls varactor diode D17 and the switches used to select different filters.

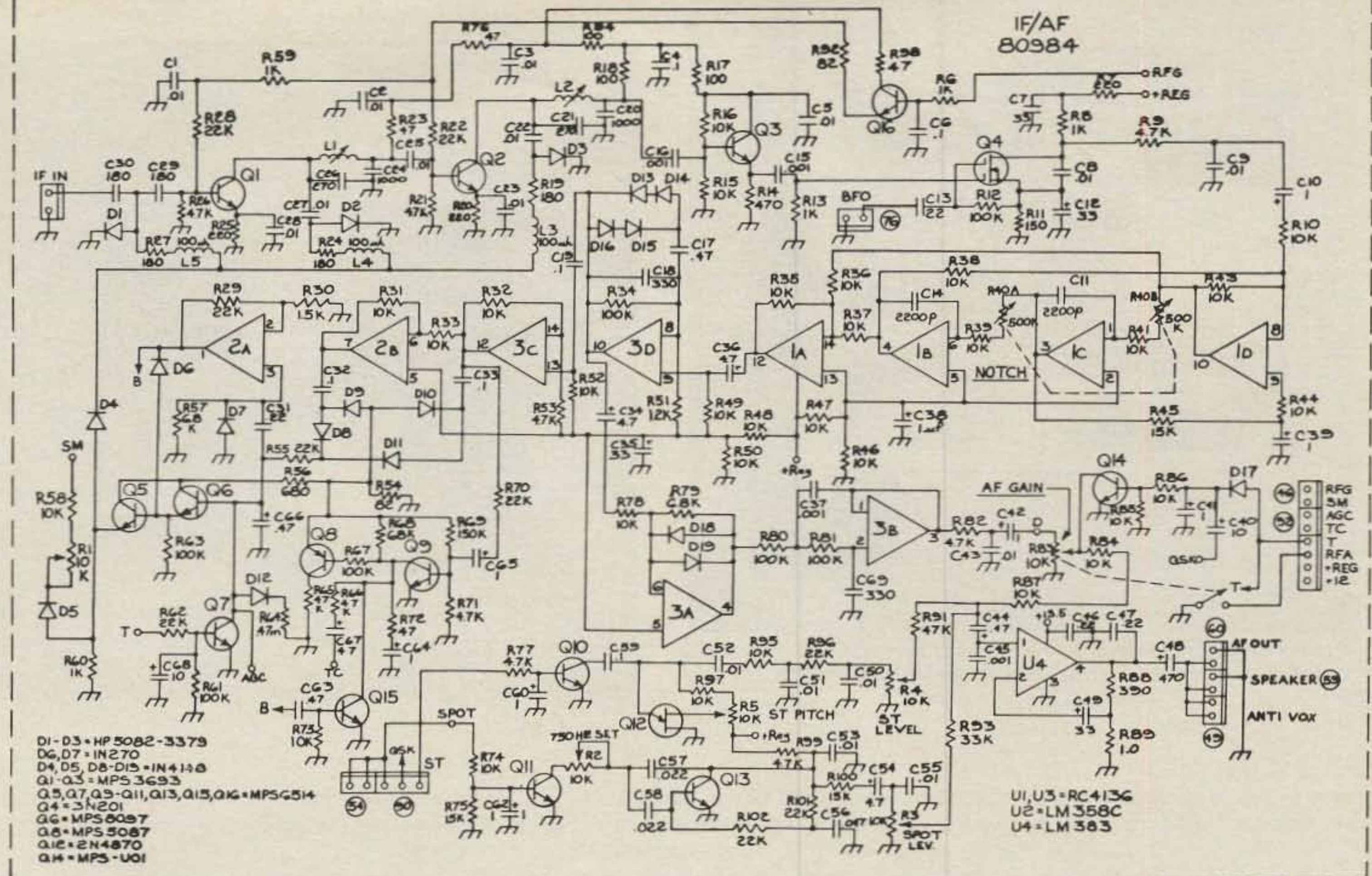


Fig. 4—The rather large i.f./a.f. board has a number of functions as mentioned in the text. The very effective a.f. notch filter, however, uses only one IC. It consists of the circuitry associated with U1A, 1B, 1C, and 1D.

cellent quality, conservatively rated components." There are not a lot of "bells and whistles" as found on some transceivers (although every needed feature is present). Overall, one receives the impression that the Corsair was designed by dedicated radio amateurs who actually use the equipment themselves.

Two photographs show the Corsair with its top and bottom covers removed. As one can see, Ten-Tec has taken the design approach of splitting the circuitry among a fairly large number of PC boards. In fact, there are some 22 PC boards. This type of approach requires a good amount of interconnection wiring, but it keeps various signal circuits isolated, and one does not have the problem of spikes and spurious signals running around a very large PC board. It is probably one reason why the Corsair has such a clean-sounding signal both in the receive and transmit modes.

One can see from the photographs that the PC boards are very neatly arranged, and a lot of care has been given to shielding of individual sections. For instance, the receive r.f. amplifier assembly is shown in the center of the photograph with the bottom cover removed, the shielded PTO assembly is below it, the output low-pass filters are to the left back in their enclosure, the r.f. power stages are in a completely shielded enclosure with heat sink mounted on the rear panel of the transceiver, etc. One can also see from the photograph of the top the space which is provided on the top-right PC board for the installation of the optional 1.8 kHz s.s.b. filter and the 500 Hz or 250 Hz c.w. filters. The bandswitching assembly (photograph of the bottom) looks rather imposing with all its sections, but it works quite smoothly. In fact, it feels like a single wafer switch

when one actually uses it. Everything is switched directly by the bandswitch. There are no diode switching schemes used as far as the main r.f. circuits are concerned. The only significant diode r.f. switching that is done is in the circuitry which selects the optional s.s.b. or c.w. filters.

Measurements

The "specs" measured on the Corsair are tabulated in Table I. It doesn't take too much perusal to see that it easily meets its advertised claims. The power output varies over an extremely narrow range from 98 to 99 watts as one goes from 10 down to 160 meters. It's interesting to note once again that although the Corsair PA has the usual thermal and other protective circuitry, it doesn't have an internal fan and it doesn't need one for extended s.s.b. or c.w. operation. Full power is available on RTTY and SSTV for 20 minutes key down, although Ten-Tec does recommend an external fan if these modes are to be used continuously. The third-order IMD products remain at a respectable -32 dB or better at full power output. Sideband rejection and carrier suppression measured a respectable -43 to -54 dB. The c.w. keying waveshape is excellently "tailored" with 3 ms rise and fall times.

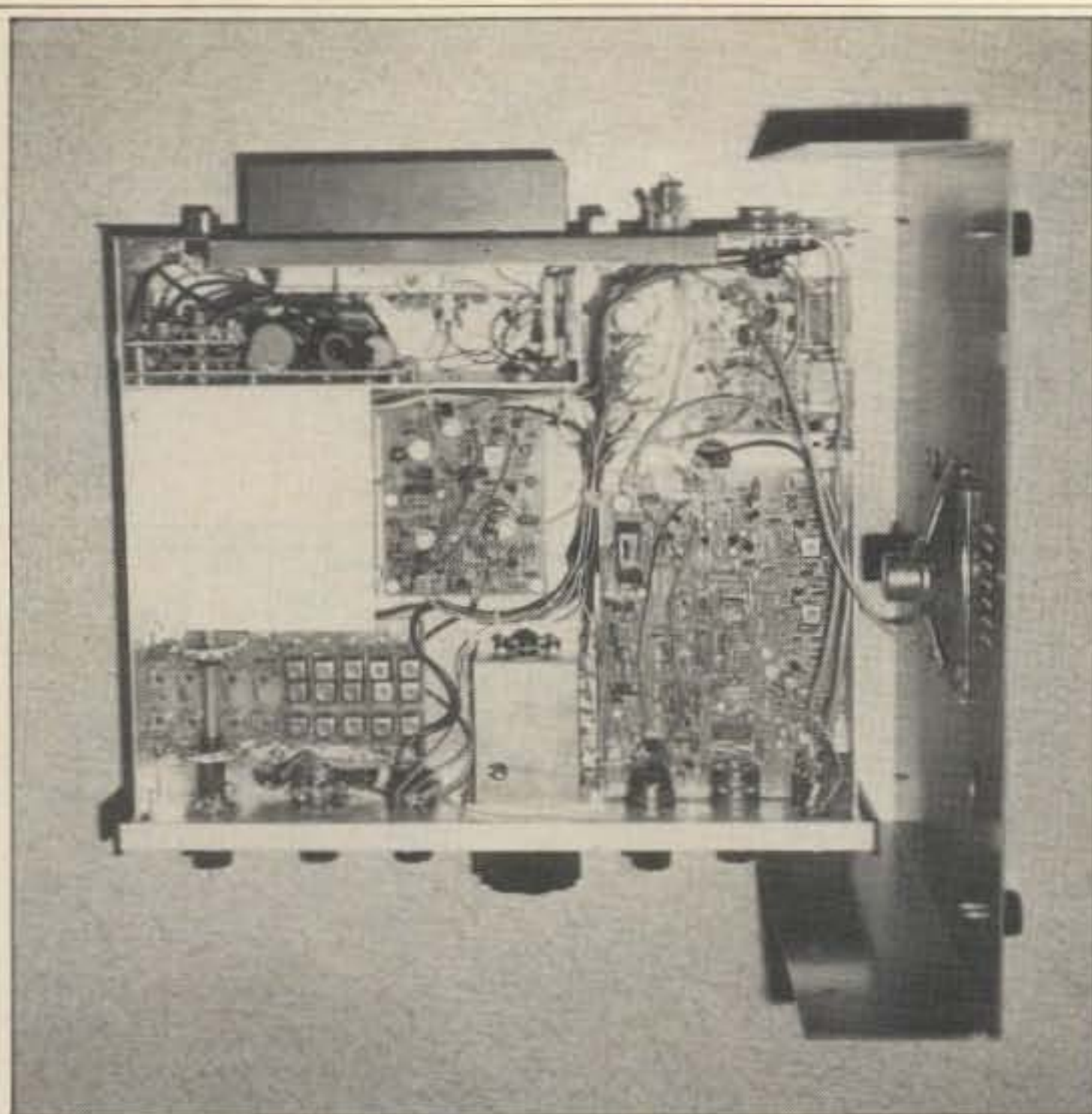
On the receive side, the s.s.b. sensitivity varies from about 0.15 μ V on 10 meters to 0.3 μ V on 160 meters for a 10 dB StN/N ratio with the r.f. amplifier in the circuit. The dynamic range measured out at a good 90 dB on 40 meters (s.s.b. bandwidth). The third-order intercept point measured a very good +7 dBm, increasing almost 10 dB with r.f. amplifier switched out. Slight receive "birdies" were

found at 6,999 and 18,165 kHz plus an S9+ one at 28,980 kHz. The latter is clearly recognized by Ten-Tec in the Corsair manual. In reality, it is not significant, since if one had to use that frequency, the transceiver could be set on 29.0-29.5 MHz and then the overrun tuning could be used below 29.0 MHz. In that case, the "birdie" completely disappears.

Operation

Operating the Corsair is easy, and, of course, that is where all the fun comes in as one appreciates the way the Corsair features and controls are arranged. The main tuning knob covers about 18-20 kHz per revolution. The "feel" is light and easy and probably will be most appreciated by the contest operator who operates long periods at a time. I would prefer to see a deeper finger well on the knob or a raised finger spinner, but that is strictly a personal preference. The digital readout is absolutely flicker-free and extremely pleasant compared to some of the miniature readouts found in other equipment.

The "S" meter is an honest one. It requires 45 μ V on 20 meters to get it to read S9. As one tunes through the bands, signals seem to come out of an almost quiet noise background. This sort of feature is hard to characterize even by noise base and other measurements. One finds it in very few pieces of equipment, and it really contributes to fatigue-free operating for the type of operator who doesn't mind spending hours searching for a select DX station. The Corsair performed remarkably well on the low end of 40 meters in the European area, where at least 50% of the "front-ends" of most transceivers completely



A look inside the Corsair with the bottom cover removed. The band-switch is on the left and can be seen extending from the front panel to almost the back panel.

A look inside with the top cover removed. All the crystal banks to the middle left are the optional s.s.b./c.w. filters.

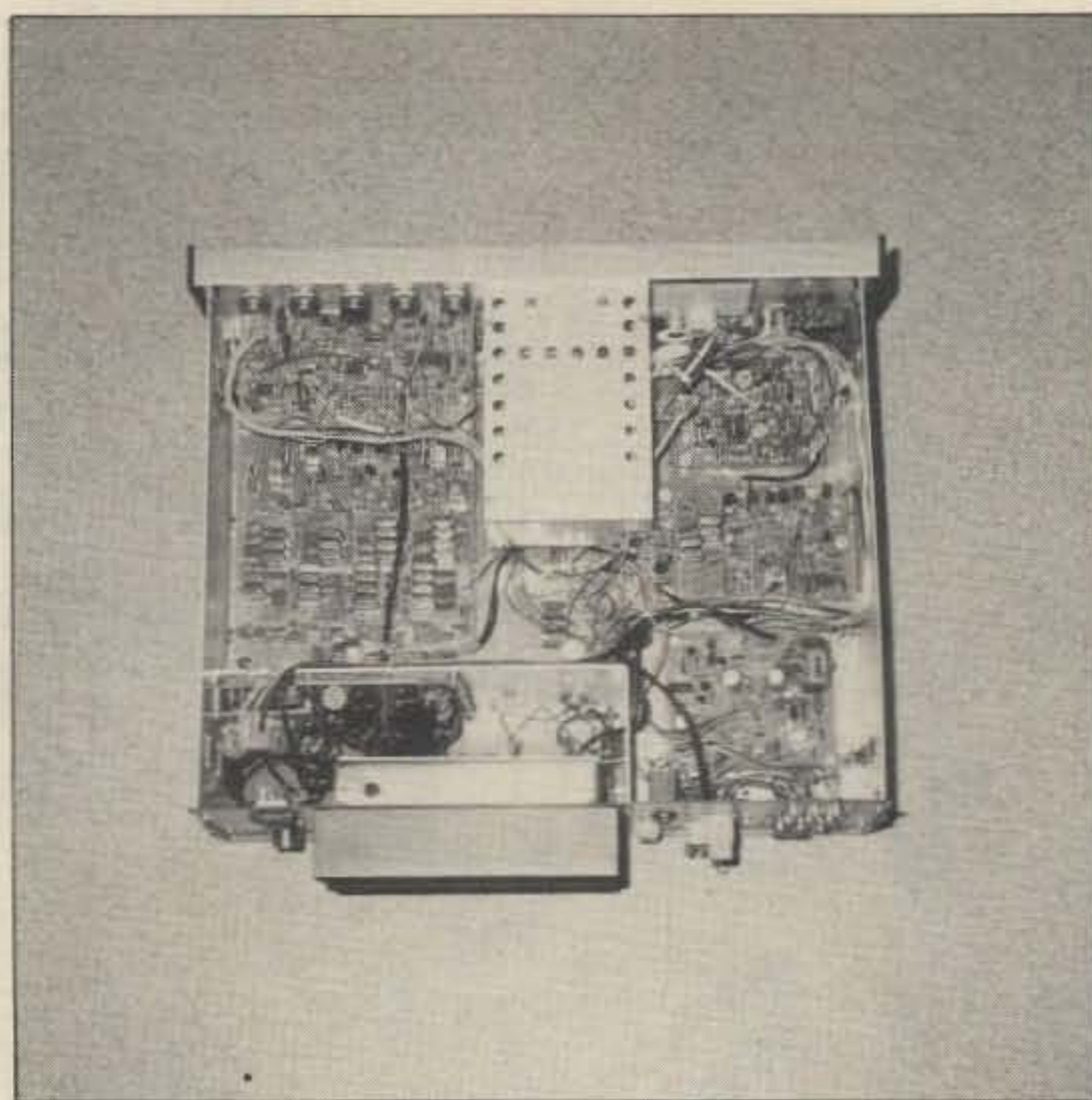
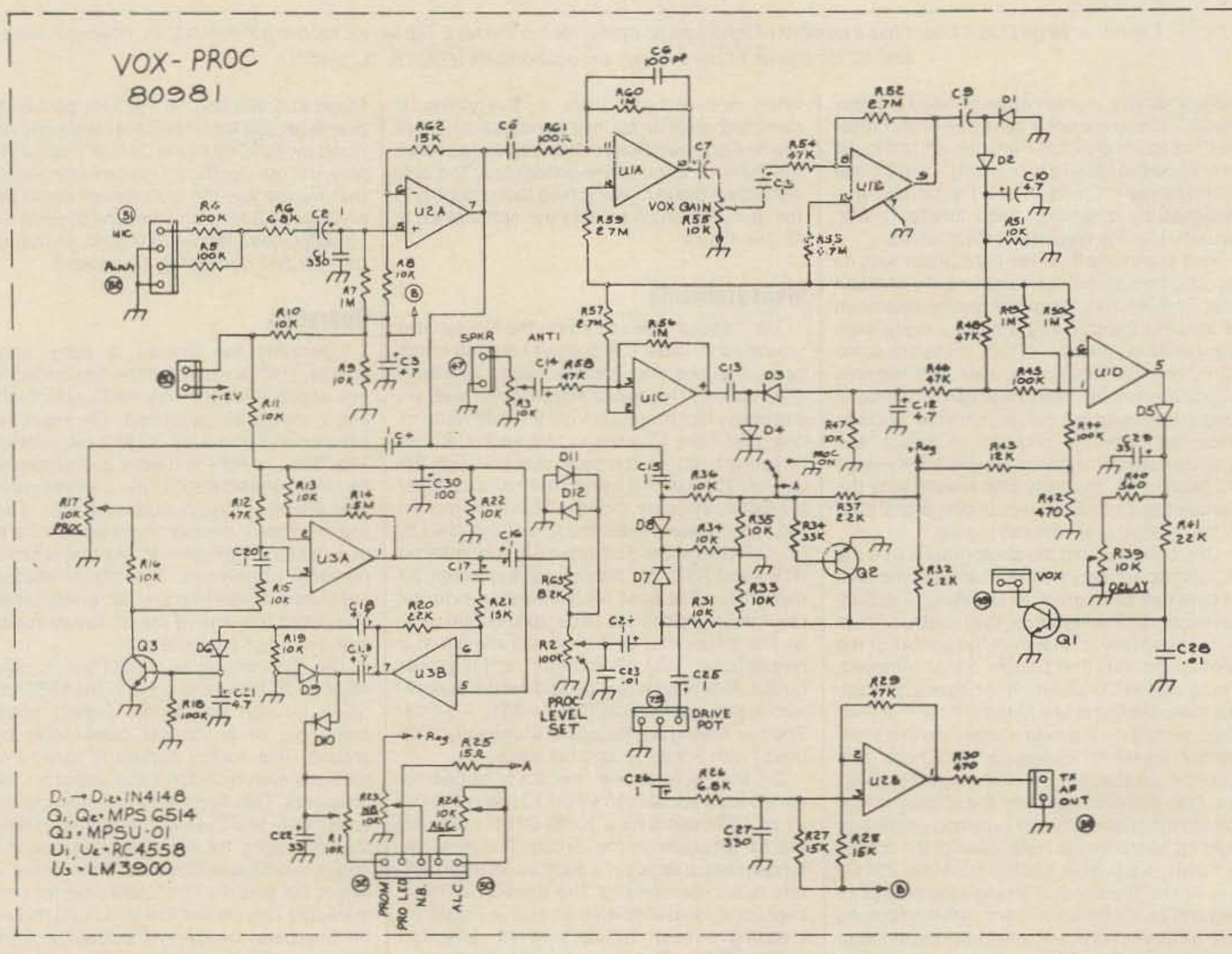


Fig. 5- Ten-Tec has come up with some interesting circuitry for the standard a.f.-type speech processor in the Corsair. The circuitry mainly centers around U3A, U3B, Q3, and diodes D11 and D12. The diodes perform a clipping function while Q3 performs a shunting function for speech compression.



fall apart in the face of broadcast QRM. The "hang" a.g.c. system is very effective, with an apparent discharge time of about 1 second on s.s.b.

The optional crystal filters, the standard notch filter, and bandpass tuning provide for about any reception problem one will encounter. The selection of optional filters is handily done by a separate toggle switch, with the selectivity increasing as one goes from the 3-2-1 switch sequence. It is handier to use than arrangements which couple filter selection with a mode selector switch. The fact that the offset tuning (RIT) provides for selectable shifts of either ± 500 Hz or ± 4 kHz makes this type of control ideally tailored for c.w. or s.s.b. operation. Both the optional s.s.b. and c.w. filters are highly recommended, but the optional 1.8 kHz s.s.b. filter deserves special mention for s.s.b. operators. It really has sharp skirts down to the -100 dB point. The use of the filter can easily make the difference between a solid QSO and a so-so QSO on s.s.b., especially during weekend QRM conditions.

The a.f. gain control has a pull-switch feature to insert or remove the r.f. amplifier from the receive r.f. line. With a beam and under extremely strong signal conditions, one might find a use for it. Normally, it probably will never be used. The noise blanker was not given a really thorough check, although it seemed to function extremely well by occasional automobile QRN at the test QTH. It seemed to help the situation somewhat when the Russian "woodpecker" would scan through one of the h.f. bands, the adjustable threshold control being very useful to tailor its response.

On the transmit side, one should first mention the easy tune-up procedure incorporated in the Corsair. On transmit, the panel meter can be set to automatically function as an s.w.r. meter and, as mentioned, there is no "set" control! The meter reads s.w.r. directly without any adjustment. To tune-up, one places the **Mode** switch in the **lock** position and advances the **Drive** control for increasing power output as one perhaps adjusts an antenna tuner for minimum s.w.r. reading on the panel meter. That's all there is to it.

When operating s.s.b., the mode switch is returned to a sideband position (normal or reverse) and the drive control readjusted so the **ALC LED** just lights on voice peaks. On c.w., no further readjustment of the drive control is required, but one can choose between fast and slow break-in operation by means of the panel switch marked **QSK/Fast** or **QSK/Slow**. Instant break-in is provided in the **QSK/Fast** position. That is, if one is transmitting a word such as **TEST** at 20 w.p.m., one can easily hear a break-in between sending individual letters. If one has the switch set in the **QSK/Slow** position, break-in's can be heard between the pause between words. In any case, c.w. operation is pure pleasure. Sidetone volume and pitch are easily adjusted by thumb-wheel controls accessed via an opening in the bottom cover. On s.s.b., consistent reports were received of good, clear modulation (a Ten-Tec electret-type microphone was used). In fact, several stations rated the audio as "superb," commenting that it was "sharp" but with just enough bass to make it pleasant to copy.

Many tests were made to evaluate the effectiveness of the Corsair's speech processor. The average result was that the Corsair's processor could increase the apparent received signal strength by 5-6 dB (about one honest "S" unit) without any noticeable audio distortion. That is rather remarkable perfor-

Band	Sensitivity (μ V)	Power Out (watts)	Harmonics (-dB)
160	.3	98	55
80	.3	99	45
40	.3	98	45
30	.24	98	50
20	.14	98	50
18	.14	99	55
15	.15	99	55
12	.15	99	55
10A	.14	99	52
10B	.14	98	60

S.S.B. sideband rejection at 1 kHz: -45 dB

Carrier Suppression: -54 dB

I.F. Rejection: -80 dB average

Dynamic Range (40 M): 90 dB

Third-Order Intercept: $+7$ dBm

Third-Order IMD: -30 dB or better

C.W. Waveshape Rise/Fall Times: 3 mS

Table II- Corsair test measurement summary.

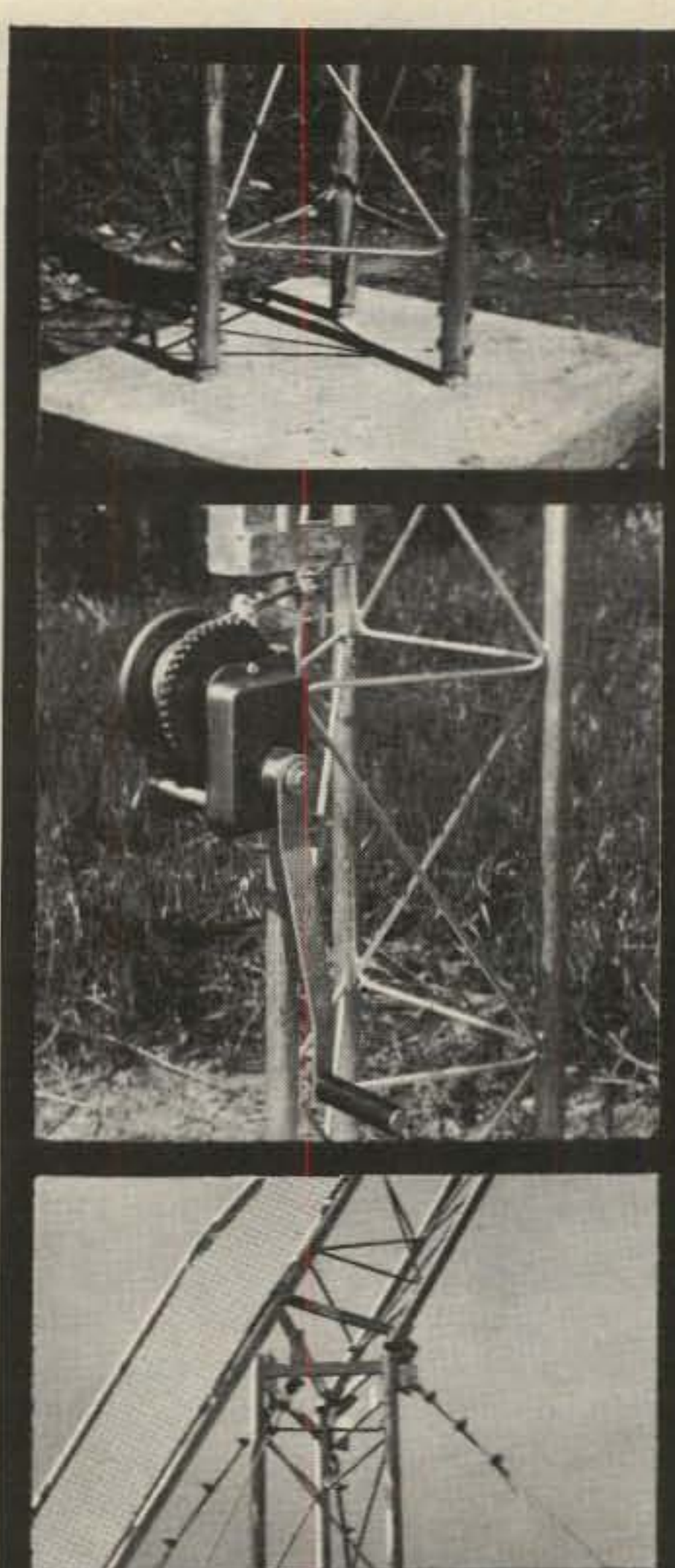
mance for a purely a.f. type of speech processor. In fact, most stations who were asked preferred the audio with the processor in use! However, as is the case with almost any type processor, one must avoid the temptation to overdo the processing. The Corsair incorporates a very handy a.l.c. LED peak indicator. If one adjusts the processor so the a.l.c. LED just lights on voice peaks, effective speech processing will be assured.

Accessories

Besides the optional i.f. filters, the main accessories available for the Corsair are the Model 260 Power Supply and the Model 263 Remote V.F.O.

The power supply is designed to deliver a regulated 13.5 volts at 18 amperes nominal or 20 amperes maximum. The circuitry consists of a bridge rectifier, 26,000 mF of filtering, and two paralleled 2N5301 pass transistors. The pass transistors are controlled by an IC regulator and driver transistor. Regulation is better than 1% from no load to full load. An SCR "Crow-bar" circuit is incorporated which shorts the output if it should go over 16 volts. Another SCR is used in a latching circuit which turns off the circuitry when the output current drawn exceeds a preset value of 20 amperes. The latter circuitry really operates quickly if one should try to tune up too quickly such that the s.w.r. to the Corsair is great enough to exceed 20 amperes being drawn from the supply. It will trip out almost instantly. It offers excellent protection for the finals in the Corsair and quickly disciplines one to tune up properly. Resetting the circuit is easily done by rocking the front panel power switch back and forth. The power supply also contains an 8 ohm ceramic magnet speaker. There is only one main output line, but extra rear-panel connectors are provided, so one also has available two regulated 12 v.d.c. outputs for small accessory items.

The 263 remote v.f.o. covers all the same frequency ranges as the Corsair. It consists essentially of the same PTO subassembly as used in the Corsair, plus switching circuits, a crystal oscillator, and additional buffer/amplifier stages. Four crystal positions are provided which one can use in any desired combination within or among the amateur h.f. bands. If one does use crystal-controlled operation, the out-of-band limits that can be achieved are somewhat greater than when v.f.o. control is used. For instance, one can go up to 4.10 MHz on 80 meters and down to 6.9 MHz on 40 me-



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The rear panel is clean and functional. There is no cooling fan, and none is needed for normal c.w./s.s.b. operation. Even after extended operating periods, the heatsink never got more than slightly warm to the touch.

ters. This may be an advantage for some specialized uses such as MARS operation. Otherwise, the operation of the 263 is basically the same as any second v.f.o., except that Ten-Tec has incorporated a few extra switching possibilities.

As a second v.f.o., the 263 can be used as just a temporary memory for a frequency of interest, as an actual operating v.f.o. for split-frequency operation, or as the main control v.f.o. for the Corsair. The mode selector switch allows the Corsair v.f.o. to control transmit/receive frequencies, the remote v.f.o. to control both frequencies, or the frequencies to be split between the v.f.o.'s. A "reverse" pushbutton temporarily exchanges the v.f.o.'s when they are set for split operation so one can quickly check that one is not accidentally set up to transmit on top of an out-of-band DX station. The mode switching also provides for both v.f.o.'s to be used on receive so one can zero beat them if desired.

All in all, the 263 proved to be just as stable as the basic Corsair v.f.o. and a very convenient operating accessory. Full break-in operation is maintained using it. As regards the optional i.f. filters, the usefulness of the 1.8 kHz filter for s.s.b. operation was already mentioned. However, I forgot to mention the optional 8-pole s.s.b. filter (Model 220), which can be used to replace the first, standard 4-pole filter in the i.f. chain. If one's pocket-book does not allow for too much leeway, the Model 220 filter probably should be considered as a primary purchase, since it works in conjunction with the passband tuning, and its use will improve both c.w. and s.s.b. selectivity until such time as one might consider an investment in specific optional s.s.b./c.w. filters.

Finally, a word about Ten-Tec's manuals and customer service. The manuals are not on glossy paper stock, but they do an excellent job. For instance, the Corsair manual writer rightly anticipated that most new owners would not first want a dissertation on transceiver theory, but rather would want to get their gear into operation. Therefore, the manual starts out with some condensed operating instructions (just enough to get the unit properly and safely hooked up and operating). It

then goes on to detailed operating instructions and finally to alignment and service. Detailed diagrams, theory of operation, and alignment instructions are provided for every PC board. Detailed voltage check-point charts are included, as well as a generous use of photographs to show parts location. The manual is labeled an "Owner's Manual," and it's nice to know Ten-Tec still thinks amateur equipment "owners" are deserving of having complete technical details on their equipment. The manuals for the accessory items are, of course, smaller, but they cover just as much respective detail.

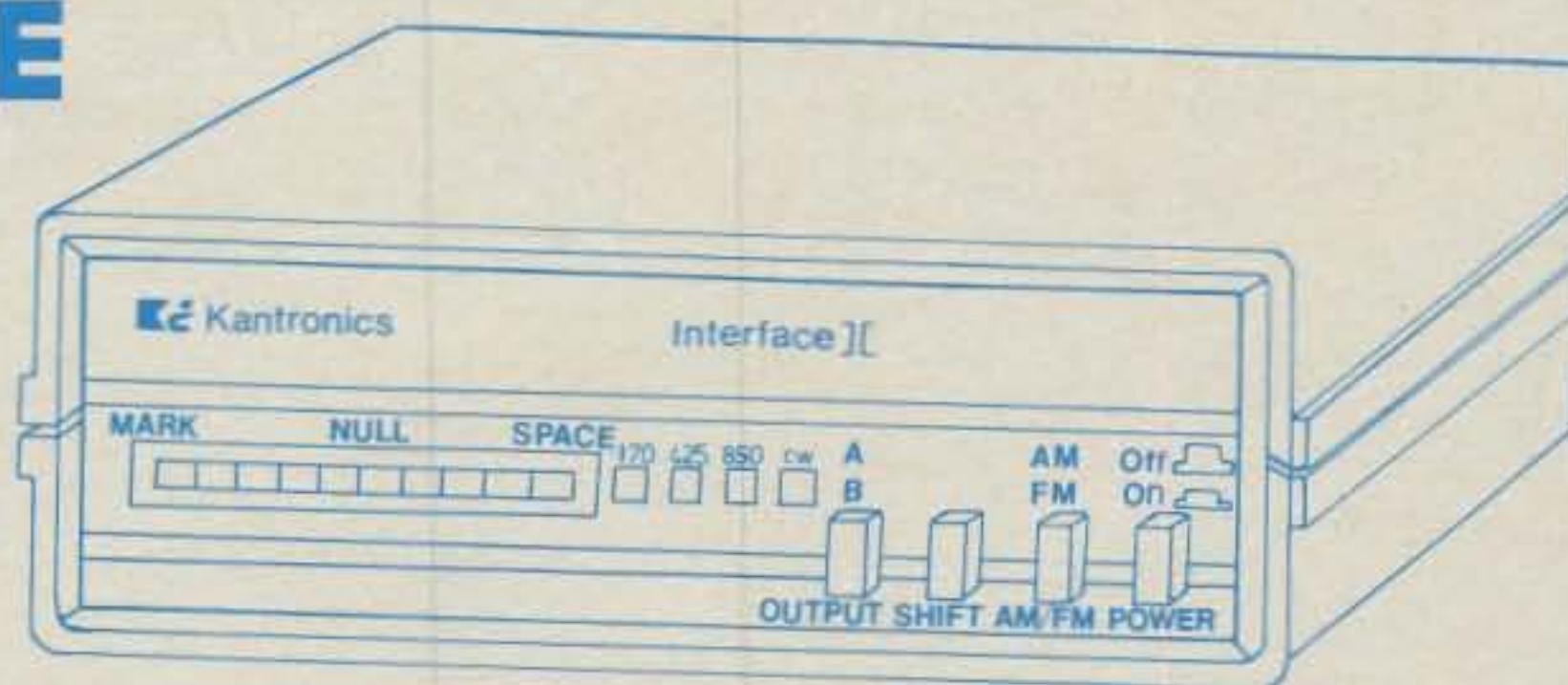
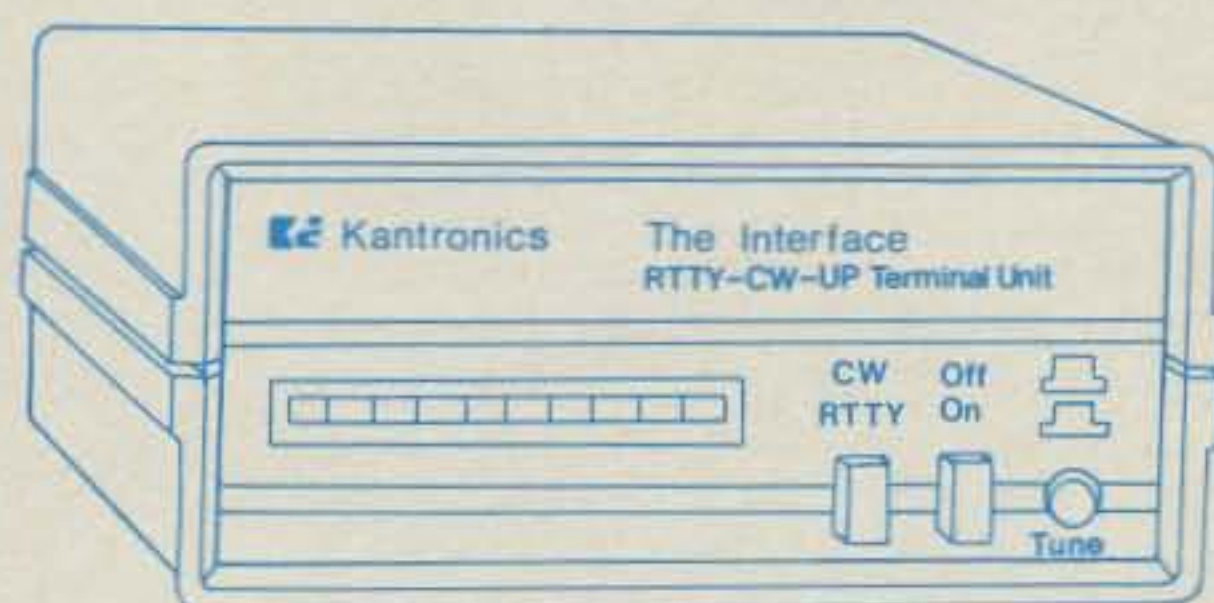
All of the equipment comes with the necessary interconnecting cables, so if one purchases the Ten-Tec line, it all simply interconnects in a few minutes' time. However, each piece of equipment also comes with extra accessory plugs (except for the totally standard ones such as the 1/4 inch headphone type), so one can make up any necessary interconnecting cable for use with equipment of another manufacturer.

The Customer Service Dept. at Ten-Tec simply has to be rated as superb, and I'm not one to give out such acclaim lightly. The Corsair received got banged around a bit during initial Parcel Post shipment to an overseas, military APO address. The receive function didn't work properly upon receipt, and the unit was shipped back for repair. Ten-Tec replaced a defective crystal on the PBT board, and the Corsair was received and in operation again two weeks later. Considering that the routing was Tennessee to New York to Germany to New York to Tennessee over a holiday season and via a complicated U.S. Postal Service/U.S. Army Post Office system, it would appear that the crew at Ten-Tec must have serviced the transceiver almost instantly. The returned Corsair even included a check to cover my mailing costs in returning the unit to them.

All in all, it is obvious that the Corsair is the culmination of many years of transceiver design and operating experience by the radio amateurs at Ten-Tec. Any amateur who invests in the Corsair and perhaps some of the accessory items should be more than well-satisfied by his purchase for years to come. 

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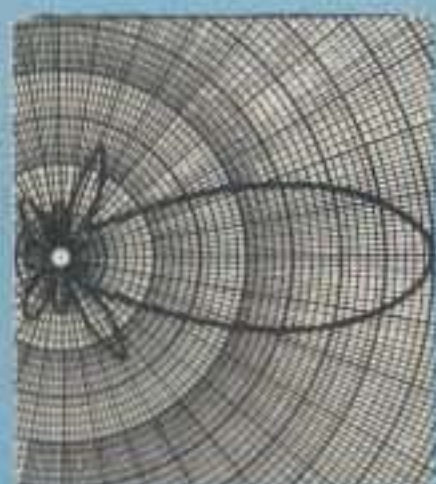
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40M214	40 Meter 2 element	(5.6 DBD)	740.00	615.00
40M329	40 Meter 3 element	(8.3 DBD)	1139.00	950.00
40M346	40 Meter 3 element	(9 DBD)	1975.00	1650.00
TB4EC	10, 15, 20M Tri-Band	(5.5 DBD)	252.00	205.00
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TB6EM	10, 15, 20M Tri-Band	(10 DBD)	735.00	565.00

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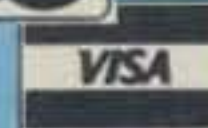
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PROGRAM OPTIONS
A. RETURN TO BASIC
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E. SET XMIT BUFF SIZE
F. EDIT HOLDING BUFFER
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I. SET TIME

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Antennas are the one thing with which amateurs like to continually putter around. W4DQU presents an interesting piece of antenna test gear that makes a great weekend project, too.

BUILD YOUR OWN ANTENNA BRIDGE

BY RICHARD E. JAMES*, W4DQU

The antenna bridge is a self-excited device which can be used for the following three purposes:

1. To determine the feed-point impedance of a resonant antenna.

2. To enable you to adjust the resonant antenna's matching device (such as a Gamma Match, a Beta Match, or a T-Match) to the impedance of the feedline.

3. To enable you to present a 50 ohm or a 75 ohm unbalanced load to your transceiver, at any frequency, using an antenna tuner, an open-wire feedline, and an all-band antenna. Examples of all-band antennas are the following:

- a. An end-fed long-wire at least $\frac{1}{4}\lambda$ long at the lowest frequency used.

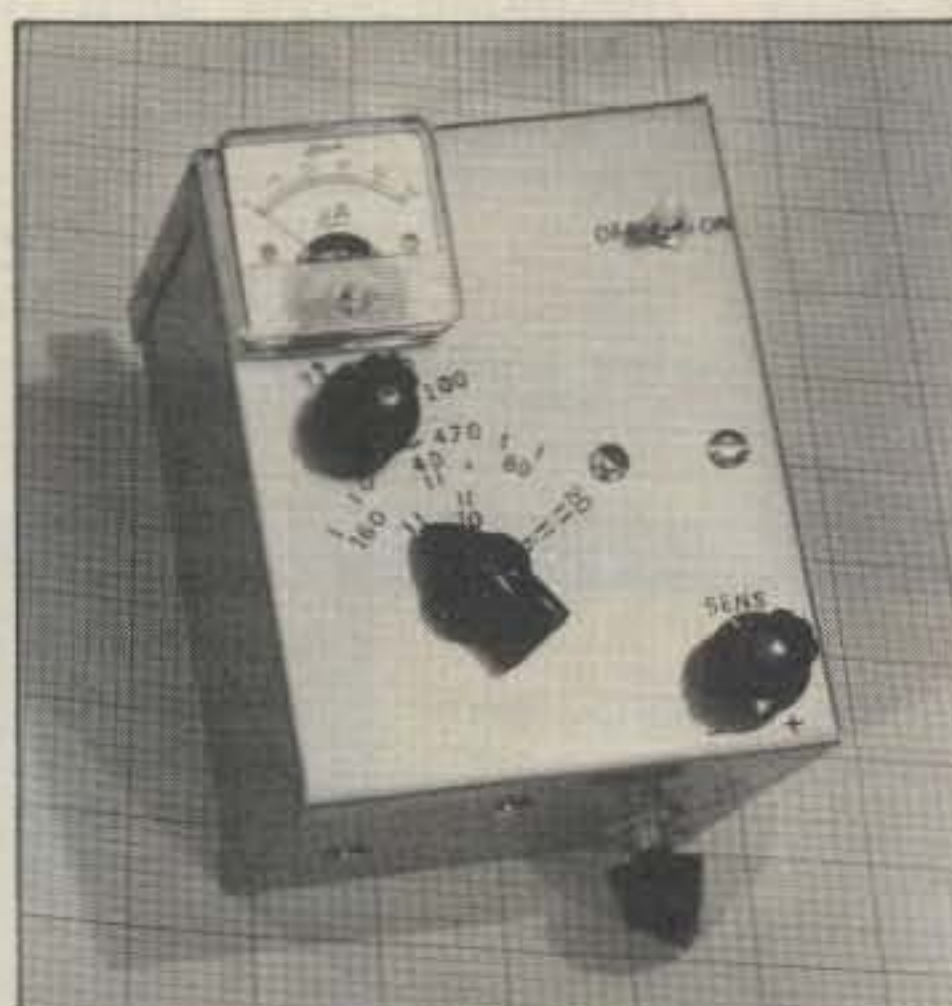
- b. A dipole, inverted V, V-beam, or rhombic with at least $\frac{1}{4}\lambda$ on each leg. In the case of a rhombic, a leg is two of the four sides.

By using a long enough extension cord, you can even take this device up the tower with you to adjust the feed-point impedance of your antenna to the impedance desired.

The antenna bridge described here was designed several years ago and was subsequently refined. I have built a number of them for other amateurs in the USA, Switzerland, and New Zealand.

Originally, I tried to use transistors, but low output and harmonics caused me to go to the 6T4 oscillator tube, which gives plenty of output and doesn't have harmonic problems. It does require a simple half-wave rectifier power supply which is not troublesome or expensive to build, and it is self-contained in the cabinet with the oscillator and impedance bridge circuits.

This instrument is simple to operate and requires no plug-in coils or Smith Charts to use.



Front view of the antenna bridge. You can dress up the unit to satisfy your own needs.

Construction

All the parts are mounted on one of the two pieces of which the cabinet is composed (see photos). I have provided the mounting layout for the 50 microamp meter sold by Radio Shack because this will be the most readily available meter around the country. (This is not the meter in the photos.) The dotted lines in fig. 2 indicate the outline of the meter. This meter only requires a 1 inch diameter hole to accommodate the works of the meter. Cut, drill, or punch this hole first, and mark around the two mounting screws for precisely locating the holes on the cabinet. If you have some other small meter within the 50 μ A to 200 μ A range, it should be no trouble to make your own layout for it.

The housing for this instrument is a Bud number CU2105B or CU3005A 5" x 4" x 3". The meter should be at least as sensitive as 200 μ A full scale. If you use a 200 μ A meter, use a potentiometer with a sensitivity of about 500 ohms or 1000 ohms max. If you use a 100 μ A meter, use a 2500 ohm pot. If you use a 50 μ A meter,

use a 5000 ohm pot. (Radio Shack has a nice 50 μ A meter for about \$8.95.) The layout is obvious from the photos.

The 420 pF variable capacitor will have to be a "junk box" item, and the mounting-hole configuration may well be different from the layout shown. In that case make your own layout, being careful to mount it low enough on the cabinet to clear P2, but high enough so that it clears the other piece of the cabinet when you put the two pieces of the cabinet together.

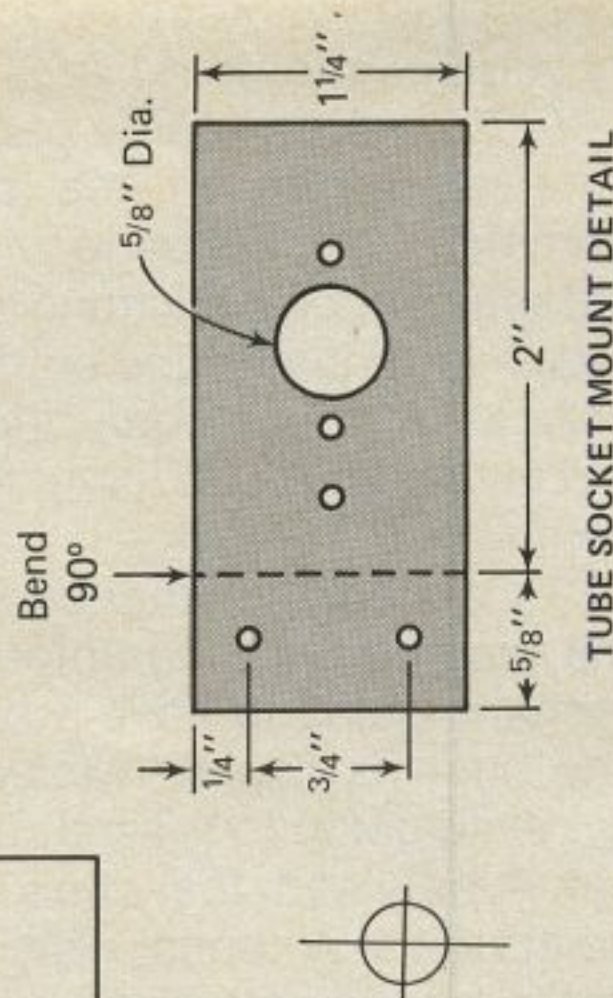
The only other part that might give you a problem is the transformer. Most suitable ones have 2 inch mounting centers, I believe, but if yours doesn't, make your own layout. Don't try to use a transformer much larger than that recommended because there isn't a lot of excess room in the cabinet.

Calibration

From the photo showing the face of the instrument, you can see that two things are calibrated. First, calibrate the variable capacitor by turning on the instrument and your radio receiver. Tune the receiver to the low end of the band to be calibrated. On the antenna bridge set switch S1/S2/S3/S4 to the proper band and rotate the capacitor until you hear a strong oscillation in your receiver. With some decal transfer material, mark that spot with a "dash." Now, set the receiver to the high end of that band. Move the capacitor until you hear the oscillation and mark it with another dash. Below or above the two dashes put the band number (6 if it is 6 meters, 10 if it is 10 meters, etc.).

Next calibrate P1. With a 50 ohm carbon resistor, short out the center of the SO-239 with the outside of it. Now adjust the pot P1 until the meter reads "0." At this point, again using some decal material, and apply the number "50." In a like manner, using other value resistors such as 22, 100, 300, 470 ohms, finish

*3653 Crestside Rd., Birmingham, AL 35223



TUBE SOCKET MOUNT DETAIL

LEGEND:

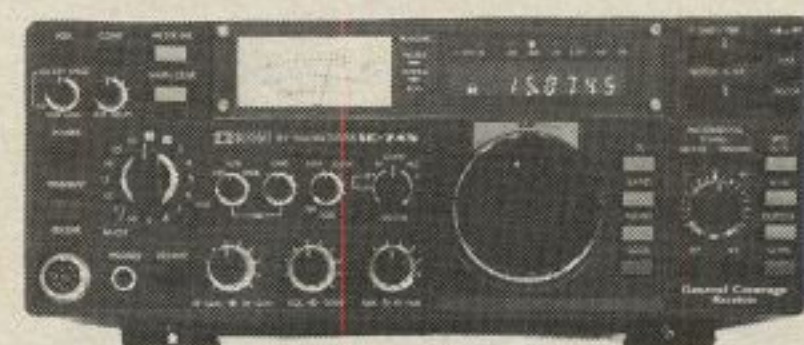
- L1, L3, L5 = 1 turn—hookup wire
L2 = About 90 turns, No. 28 enameled wire
L4 = 30 turns, No. 20 enameled wire
T1, T2 = Amidon T-68-2 toroid cores
T3 = Amidon T-50-6 toroid core
S1, S2, S3, S4 = Centralab PA-1007
(3 pole—3 position non-shorting phenolic switch)
Cabinet = BUD-CU2105B or BUD-CU3005A
P1 = Clarostat 381-N-1000
T4 = Stancor PS-8415 or equal

All resistors are $1/2W$, except in the power supply
All capacitors are disc ceramics, except in the power supply

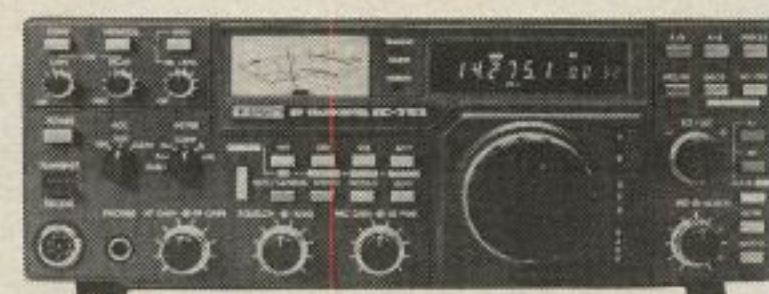
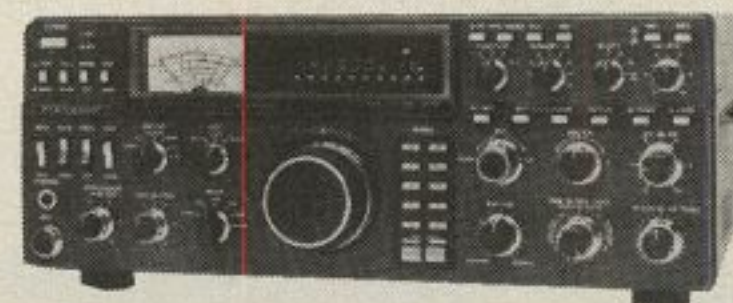
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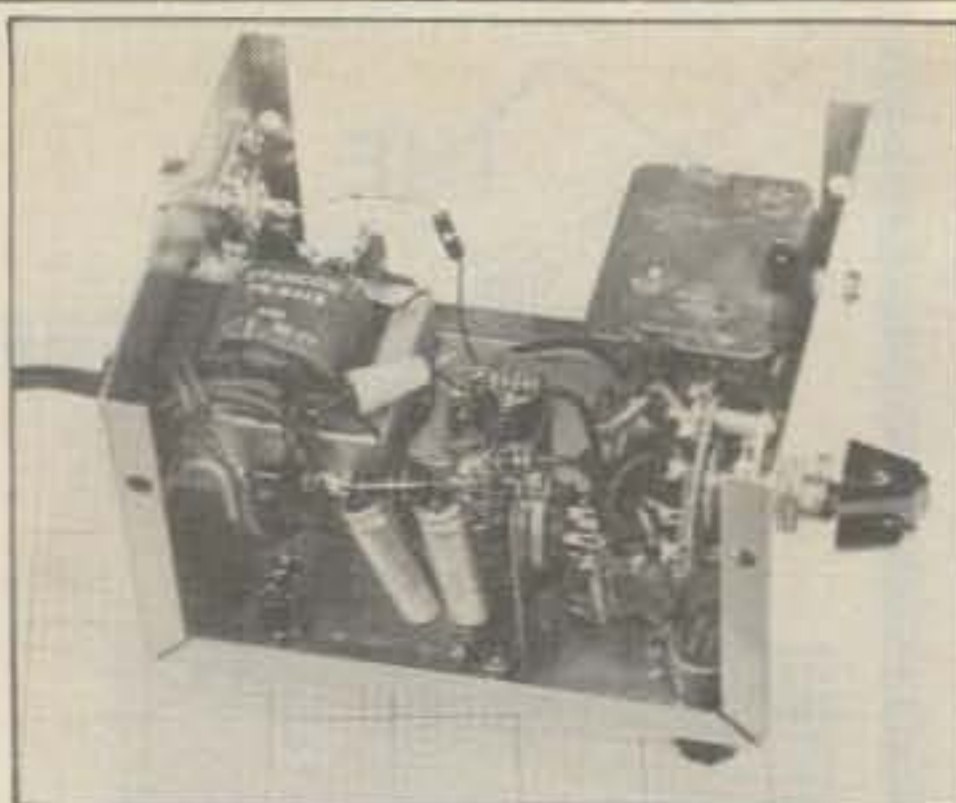
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Interior view of the antenna bridge. Wiring of the components is done point to point and is not cramped.

calibrating P1. The 50 ohm position is the very important one and the one you will use most of the time.

Using The Antenna Bridge

A. To check the feed-point impedance of an antenna:

1. Connect a very short piece of RG8U or RG58U (with coax fitting on each end) to the SO-239 on the front of the antenna bridge.
2. Put the bandswitch to the proper band setting.
3. Adjust the sensitivity control to maximum (or about maximum).
4. Turn on the antenna bridge.
5. Turn on your receiver.

6. Adjust your receiver for the frequency you are interested in.

7. Tune the variable capacitor on the antenna bridge to the correct band. Somewhere in the band you will hear the antenna bridge oscillating in the receiver. Leave antenna bridge on this frequency.

8. Take the antenna bridge to the antenna without changing the frequency setting.

9. Connect the other end of the coax to the feed point of the antenna. (If the antenna is going to have a balanced feedline, such as 72 ohm twinlead or 300 ohm twinlead going to a T-match, use a 1 to 1 balun between the coax and the feed points of the antenna. If the antenna is going to be fed with open-wire line and an antenna tuner is to be used, obviously there will be no need to antenna bridge the antenna.)

10. Adjust the pot marked Ω until the meter reads 0 or as low as it will read. Now read your antenna impedance. If it is anything but 50 ohms (or whatever is the impedance of your feedline), set the pot for 50 ohms (or whatever) and adjust your antenna match (Gamma or otherwise) until the meter reads 0. Now your antenna will have the same feed-point impedance as the impedance of your feedline.

B. To tune an antenna tuner:

1. Connect a short piece of RG8U or RG58U (with coax fittings on each end) to the SO-239 on the front of the antenna bridge. Disconnect your transceiver from

your antenna tuner. Connect the other end of the short piece of coax to the "Transmitter" terminal of the antenna tuner.

2. Put the bandswitch to the proper band setting.

3. Adjust the sensitivity control to maximum (or close to it).

4. Turn on the antenna bridge.

5. Turn on your receiver.

6. Adjust your receiver for the frequency you are interested in.

7. Set the pot marked Ω to 50 ohms.

8. Tune the variable capacitor on the antenna bridge to the correct band. Somewhere in the band you will hear the antenna bridge oscillating in the receiver. Leave the antenna bridge on this frequency.

9. Tune the antenna tuner until the meter on the antenna bridge reads 0.

10. Your antenna tuner is now adjusted to present a 50 ohm load to your transceiver at this frequency.

11. Disconnect the antenna bridge from the antenna tuner and reconnect your transceiver to the antenna tuner. (If your antenna tuner does not have an s.w.r. bridge built in, you will want to put one between the transceiver and the antenna tuner for monitoring your output and for making slight tuner and/or transmitter adjustments as you go up or down the band.)

That's all there is to it. Build one and use it; it's fun to learn about antennas this way.



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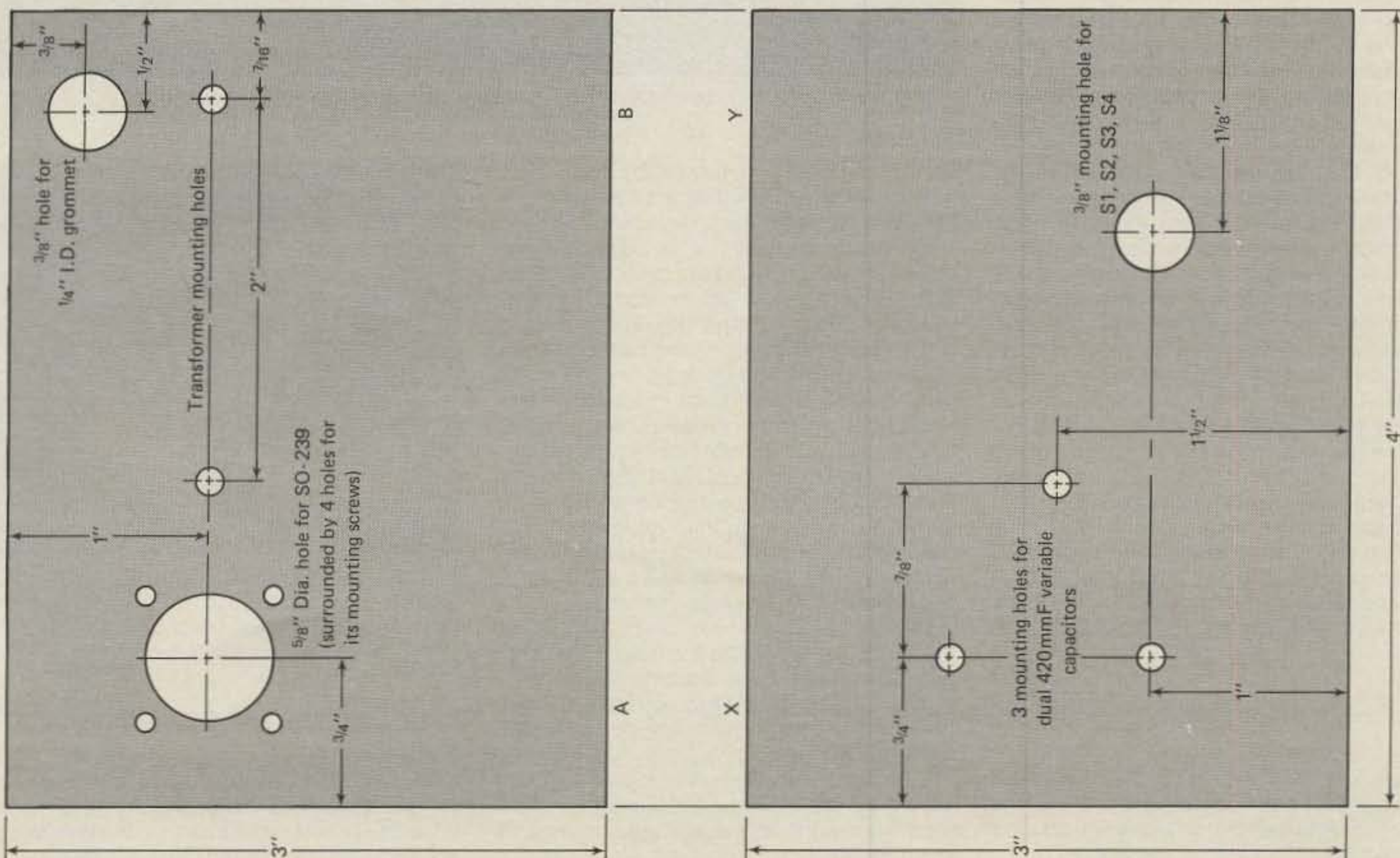
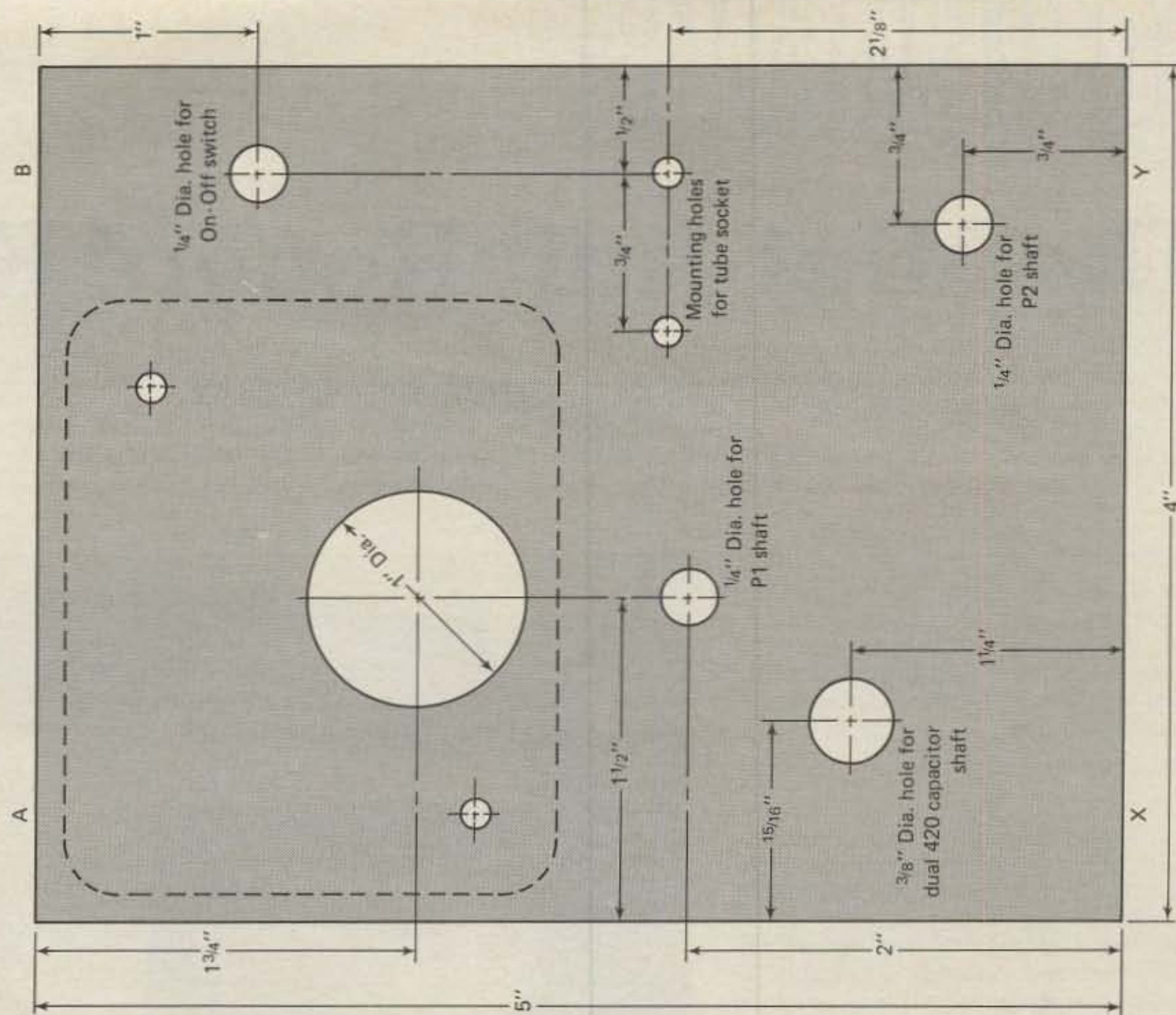


Fig. 2- Mechanical layout for the antenna bridge. Dimensions may have to be altered to fit available components.



CQ REVIEWS:

The Mini Jini™ Record Keeper

BY KARL T. THURBER, JR.* , W8FX

Author Thurber examines the popular Mini Jini™ record keeper, and comes to the conclusion that a computer database is for just about everyone. His presentation should be of interest to those considering the purchase of hamshack software.

There are several major classes of software that almost every computerist needs sooner or later. These "must haves" include various categories of high-level programming languages, word processing and related programs, electronic spreadsheets, and, of course, database managers. The latter can be an especially valuable addition to the shack.

Basically, a database or file manager is an electronic tool that enables you to collect and manipulate information and retrieve it in a form useful to you. The information or data must be structured in some way, usually in the form of a record. The record contains individual pieces of information pertaining to the record and is collected in **fields**¹. The data so collected is organized and stored in computer files analogous to the file folders in a filing cabinet; you would have separate files for each category of information. Computer-based filing systems allow fairly simple data entry, viewing, ordering, searching, fixing (modifying), printing, and storage. Simple databases should do all of these things, and many allow much more sophisticated manipulation of the data. Advanced capabilities include the ability to handle large numbers of records and fields, sort on multiple fields, index data, generate reports, accommodate variable-length data, and allow mathematical calculations. Few databases, however sophisticated, will do all of these things equally well.

In the hamshack there are a number of operations that can be facilitated using a computer database. These include handling various logging chores (especially for contests), checking dupes, maintaining WAZ/WPX/DXCC award records, indexing magazine articles and construction projects, recording the value of amateur equipment (for insurance pur-



The Mini-Jini™ cartridge, instruction manual, and the amateur application package disk.

poses), and even generating QSL card labels. Amateur radio club officers can also use a database manager for maintaining membership records and rosters, including financial statistics and newsletter mailing-label file data, to mention just two examples. General-purpose household uses include home financial decisionmaking, checking-account reconciliation, appointment tracking, tax and investment record-keeping, recipe collecting, household budgeting, and telecomputing, to name but a few practical, day-to-day applications.

Okay, you need a database. But where to start? In this article we'll just assume for the purpose of illustration that you own either a Commodore 64 or Vic-20 computer (you may not, of course), and we will use the Mini Jini™ record-keeper as a point of departure. In this review we will look at basic and advanced capabilities, various enhancements and interface possibilities, and documentation. We'll also highlight some of the problems and limitations of the software and venture a purchase recommendation.

After first noting the software profile in fig. 1 and the directory printout of the ham applications disk in fig. 2, let's examine basic features and capabilities.



The Mini-Jini™ is ROM-based "firmware" that plugs into the cartridge slot of the Commodore 64 or Vic-20 computer. It is shown in this photo installed on a Commodore 64.

Basic Features and Capabilities

The Mini Jini™ is menu driven and self-prompting. After the cartridge is inserted and the computer and peripherals (disk or tape drive and printer) are turned on, the **Main Menu** appears with each of the functions displayed.

*317 Poplar Drive, Millbrook, AL 36054

¹An example of a **field** might be the deposits column in your bank-account record. It is one aspect of a total picture, an individual piece of information.

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2M-14C

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special committee memberships, active or inactive status, etc. A selective printout of this data in report format would constitute a comprehensive club membership directory.

The Mini Jini™ also provides a disk utility function to enable necessary disk operations to be performed from within the program. Capabilities include calling (displaying) a disk directory, initializing a disk, formatting ("NEWing") a disk and SCRATCHing a file. Following disk operations the program may safely be continued without loss of data.

Enhancements and Interfaces

It is important when selecting software to strive for compatibility between software packages and file structures—to purchase the fewest number of programs possible to accomplish a given range of tasks. This approach minimizes the differences in formats, commands, and options which must be learned with a variety of software packages which are used regularly. It also minimizes the efficiency-robbing piecing-together of several packages to collectively perform the same functions that one or two programs might perform.

There are many single-purpose databases available for amateur logging and contest tracking, mailing-list generation, equipment inventorying, and the like. Most of these programs are designed for a specific but limited application and cost about \$10 or \$20 or so. With the exception of an expertly written, single-purpose "dedicated" program that does the intended job better than a multipurpose database could, it may be better to purchase a single, flexible database that can perform almost any kind of record-keeping task. Doing this not only means having to learn only a single program's formats and commands, but it also means a cost saving, as only one program need be purchased to handle a multitude of tasks.

The database-wordprocessing interface is an especially important one in today's "automated" home, hamshack, and business. As an example of this interface, an amateur club's membership list maintained by a database program can be used to generate simple mailing labels, and may also be easily "merged" with a wordprocessing or forms-writing program to prepare personalized form letters to the membership. The wordprocessing program would generate the basic letter, while the database program would "fill in the blanks" with the appropriate information.

The Mini Jini™ is directly file-compatible with wordprocessing systems such as **Word Pro 3+/64™** from Professional Software and **Busiwriter™** from Skyles Electric Works in order that integrated applications as described above can be made. An example is provided in the user's manual. The manual also describes how to convert JINSAM™ files, as well as files you may have set up in other formats, into a form that Mini Jini™ can work with.

Other enhancements planned for the Mini Jini™, which should be available by the time this review is printed, include a Mini Jini "Forms Writer" or report generator cartridge and a Mini Jini "Deep Sort and Change." The former is a free-form report writer that allows additional flexibility in building a custom report from file data, as it allows entry of text or data anywhere on a page. The latter utility allows restructuring of fields (such as adding fields), or sorting of files on multiple fields.



Video-monitor display showing the Main Menu with the 10 major file functions. The menu also displays the number of records in the file and the option or menu choice selected.

Documentation

It's almost axiomatic that, unlike the case with the cover on a book, one can often judge the quality of a software package by its documentation—or lack thereof. Poor software rarely comes with good documentation, while good software usually is replete with adequate, easy-to-use documentation.

The Mini Jini™, with its overall simplicity and menu-driven operation, is largely self-documented. However, the cartridge comes with a 39-page, 5½" × 8½", glossy-cover user's manual that is nicely written in a tutorial style with a number of examples and lessons. The manual—with its table of contents, reference section, and appendix—includes sufficient information for beginners and moderately experienced users. The summary of commands and the "hints and kinks" portions of the instruction manual are particularly useful to the beginner. Advanced programmers might wish to read more about technical details, interfacing requirements, use of other printers, etc.

The documentation for the pre-formatted application package files consists of 8½" × 11" sheets, one sheet being applicable for each pre-formatted file. These instructions outline each application example in the form of a structured lesson plan. By using the lesson plan, the user is "walked through" each required action to set up a particular file.

In addition to the amateur radio application package, I also obtained the dealer demo. No particular instructions were included with the latter package other than a listing of the pre-formatted files included on the disk. Most of the files are self-explanatory, however.

Problems and Limitations

The Mini Jini™ performed up to expectations and was easy to use simply by following the screen prompts and the instructions contained in the user's manual. Of particular note, the pre-formatted files were quite helpful. I found it difficult to "crash" the program; the user's manual includes recovery procedures to use if you pop out of Mini Jini™ due to an error of some sort occurring. This is unlikely, however, since the cartridge has a machine-language routine that takes care of recovery automatically.

Although I consider the system to be a good, solid product overall, as with most applications software, even the best, there are some limitations. Improvements I would like to see incorporated include:

1. A method of searching and sorting more than one field at a time. This limitation, however, should be corrected by the "Deep Sort and Change" utility.

2. Some means of linking segmented files when manipulating file data. This would enable the merging of files that had been broken down into separate files in order to fit within available computer memory.

3. Ability to set up more than 10 data fields, and to restructure the data file format at a later date. (The "Deep Sort and Change" utility should take care of this minor annoyance.)

4. An enlarged user's manual, which might include more technical details on the cartridge and on interfacing with other than Commodore printers, as well as tying-in to other software packages. (According to the manufacturer, Chilton Books will publish a "how to" book which should be helpful in advanced applications.)

5. The addition of "relational" math and search operations, such as "greater than" or "less than," which would expand the cartridge's capabilities by a great deal. (The two new enhancement cartridges already mentioned include these advanced capabilities.)

Summary and Recommendations

In this review, we have examined the Mini Jini™ record-keeper in the light of the requirements for a good database manager. How does the system stack up with these requirements in mind?

The Mini Jini™ offers a good balance of price, simplicity of operation, and useful performance. Despite its moderate cost, the program has some unique features, and it is flexible and adaptable. At a price of \$89.95, it is definitely worth consideration, if you want to manipulate moderate quantities of data easily and efficiently. I would particularly recommend it to the beginner who wants to get involved in serious database management with a minimum of hassle and confusion.

A final note: Users who need a more powerful database can look forward to the introduction of the JINSAM™ Data Manager for the Commodore 64 in the near future. The new system, a version of the firm's commercial database for the PET computer, is expected to be priced under \$200 and is file-transferable with Mini Jini™.

Can a good computer database such as this lessen your record-keeping burden? If you analyze your needs carefully and investigate the capabilities of the software packages that appeal to you, the answer is quite probably a resounding "yes."

Additional Reading

Barden, William, Jr., "How to Buy Software," in the "What Do You Do After You Plug It In" column, *Popular Computing*, January 1983.

Halfhill, Tom R., "Selecting the Right Word Processor," *Compute!* April 1983.

Hart, Glenn A., "How to Buy a Database Manager," *Creative Computing Software Buyer's Guide*, 1983.

Mini Jini™ product review, in *Journal/20*, July 25, 1983.

Pearlman, Dara., "The Database—A Modern Fable," in the "Random Access" column, *Popular Computing*, January 1983.

Thompson, Colin F., "Living with Mini Jini," *Commander*, August 1983.



Grenada has not always been a site for invasion, nor a war zone, nor even a hot-bed of political intrigue. It was and probably again will be a beautiful spot not only to live, but to enjoy a vacation in sunny splendor. W5SJS fills us in on what Grenada was like a few short years ago when he and K5KG went there on a DXpedition.

Recollections of a DXpedition to J3-Land, Grenada

BY L.D. BURNS*, W5SJS, AND GEORGE I. WAGNER*, K5KG

Due to recent events, most of us have become quite familiar with the sites depicted in the photographs of this article. We all spent an anxious week or so learning about this small island, its geography, politics, and the food products that are exported. In this tumultuous situation amateur radio was a vital link in keeping the world informed as to what was actually happening on Grenada. This article speaks of a time when amateur radio was just part of the fun offered on a summer vacation.

—K2EEK

—K2EEK

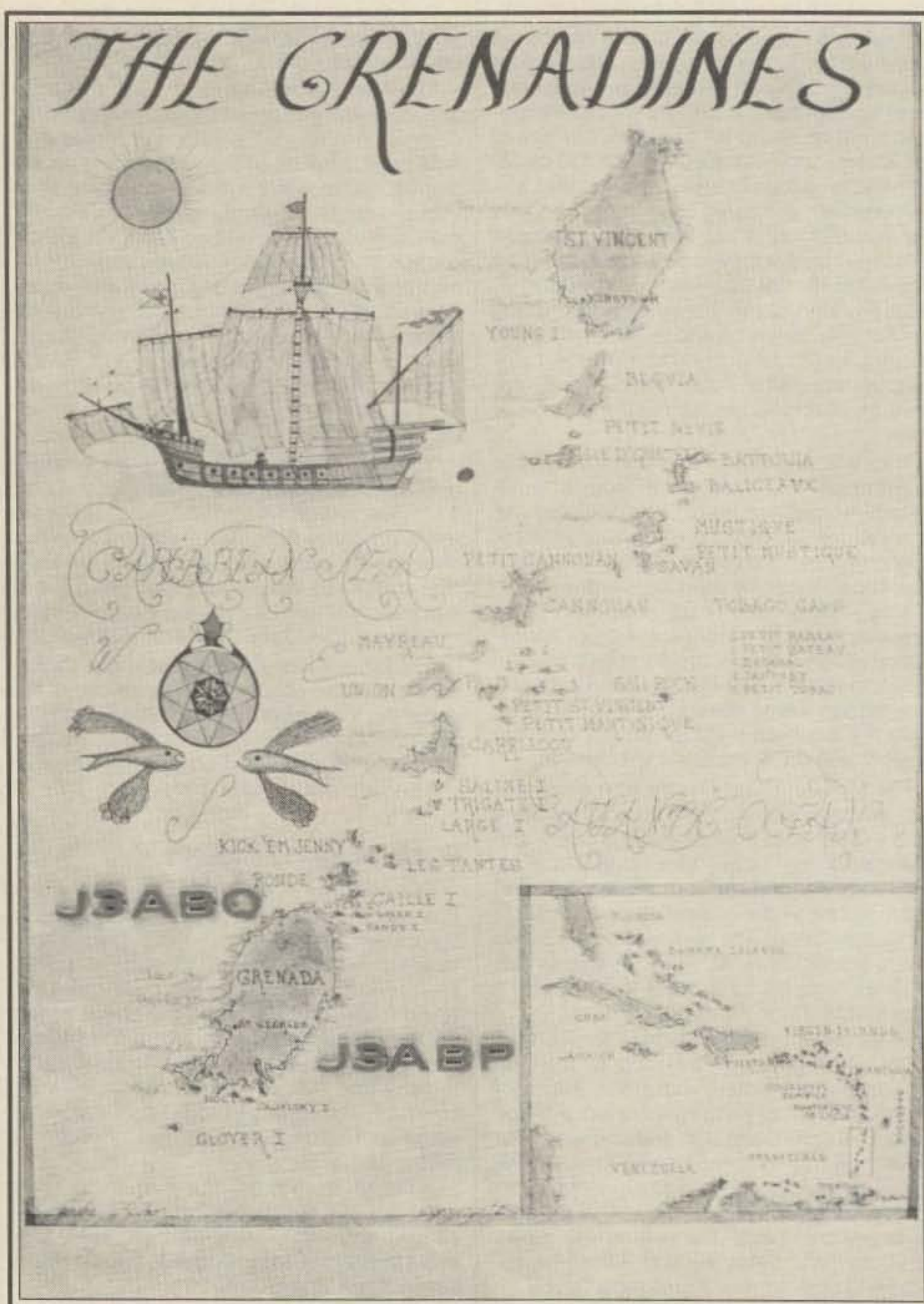
This trip began with the author's fantasizing about venturing to one of the world's remote corners and conducting an operation that would wet the appetite of any operator who quivers at the thought of a good band opening. Of course, we really did not get to a terribly remote corner, but we certainly got off the beaten path—to the Island of Spice, Grenada—to what turned out to be a rather rare country.

Preparations

In planning this two-couple vacation, our prime objective was to combine a mini DXpedition with a quiet retreat and relaxation with our dear and patient XYL's. As it turned out, the DXing component was more maxi than mini, and there was probably a little too much quiet and relaxation for the gals, but it was great fun and we all remain close friends.

About a year before the trip took place, we began searching for a good location for vacationing—sun, surf, etc.—which had not experienced a lot of amateur activity in recent times. Our budget confined us to the Caribbean or Central

J3ABP/J3ABQ title slide—an ancient map of the Grenadines.



*P.O. Box 4312, Houston, TX 77001

Len, J3AJ, trying out the Yaesu FT-901.



Left to right are Capt. Kim and Yassy, JA4YDS, of the HMS Golden Island.



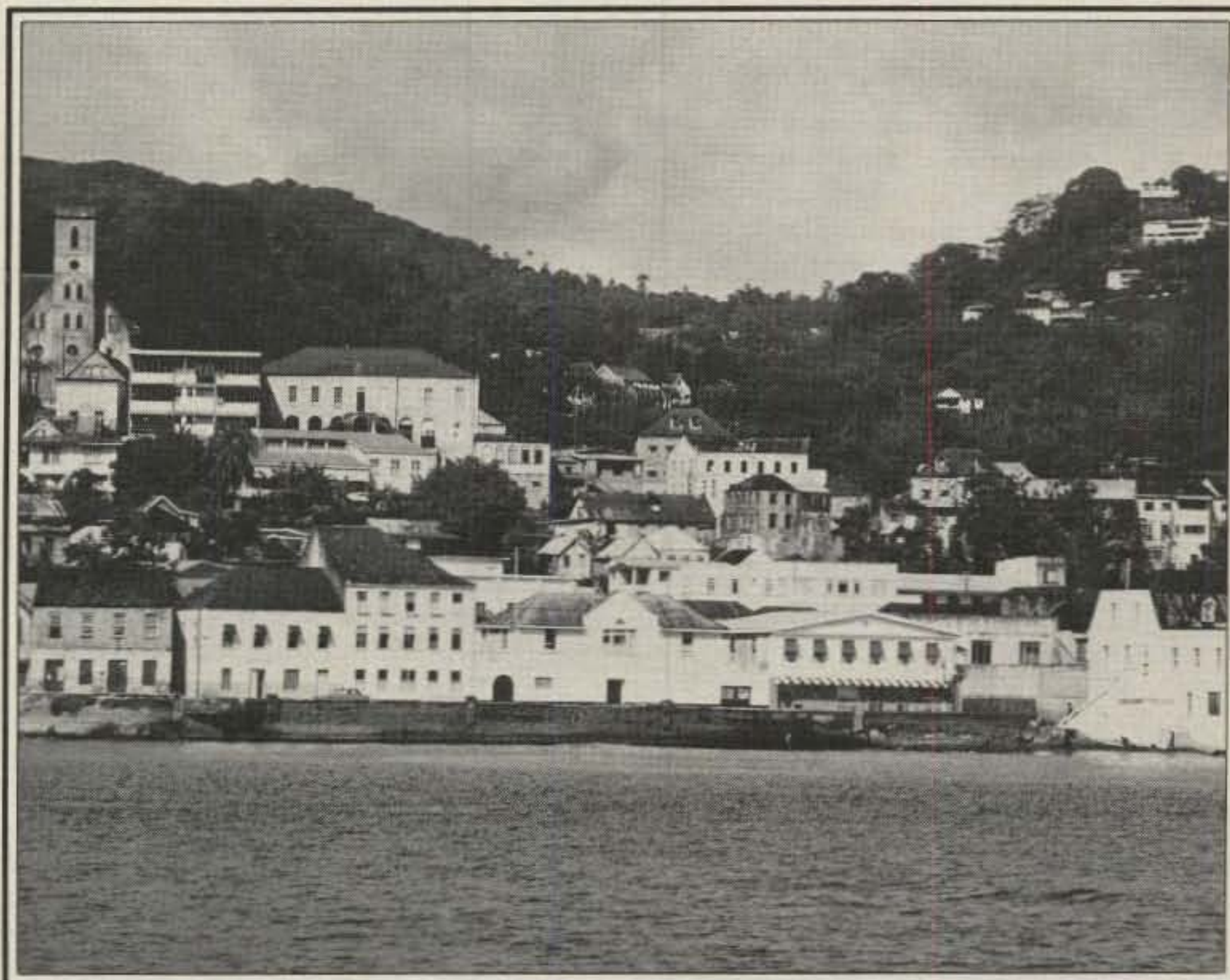
Grand Anse Beach—an excellent beach for swimming.

J3ABQ, the 76th and 77th licensed Grenadian amateurs, respectively. When we arrived in Grenada, we learned that without these documents in hand the customs officials might not have admitted our radio equipment—at least not without a cash deposit.

Prior to actual departure, we had many things to do, such as obtaining passports and completely checking out all the gear. Bob had been on similar ventures to St. Martin (FG0CRZ/FS7), Montserrat (VP2MJS), and Grand Cayman (ZF2AS), so he was familiar with much of the planning that had to be done. Action item lists which we developed over several months were followed religiously. This we learned from stories of Clipperton, where someone forgot the booze!

Equipment planning and preparation

A view of the town of St. Georges from the Caribbean.



America. In discussing this with a lot of the DX gang (mostly fellow members of the Texas DX Society), our choice came down to St. Vincent or Grenada, both of which lie in the eastern Caribbean. We contacted the stateside QSL managers for several amateurs on these islands to get leads on potential QTH's and licensing arrangements. This led us to Bob Nelson, J3AO, and resulted in our being able to lease his home in Grenada during June 1979, when he was not using it. The house is one of the finest in the Caribbean. It not only came equipped with a Mosley CL-33, SB-200, and various dipoles and verticals, but with two lovely young Grenadian ladies who did all the cooking and housekeeping, and a very private swimming pool. To top it all off, the house is situated on a ridge 400 feet above the harbor in the island's capital of St. Georges, which affords both a spectacular view and excellent propagation in every direction.

Several months before our trip, Mr. Nelson obtained our Grenadian licenses and mailed them to us in the States. George got the call J3ABP and Bob got

were carefully carried out. Bob planned to take an IC-701 and Nye keyer. Madison Electronics graciously supplied an FT-901DM, an FT-625 6 meter rig, and other equipment, including a Cushcraft 6 meter Yagi, two Palomar preamps, a Palomar keyer, and assorted spares. Alex, WA5UHT, of City Electronics, also assisted with a compliment of spare tubes. In addition, we took spare headsets, 220 v. to 110 v. transformers (Grenada commercial power is all 220 v.a.c., 50 Hz), batteries, an 80 meter dipole, nylon cord, spare coax, fuses, and a complement of hand tools. We weighed in at 250 lbs. All of this equipment was set up and operated for two weeks prior to the trip. By doing this we flushed out a faulty FT-901 receiver and a miswired c.w. filter.

The 1C-701 and FT-901DM transceivers were packed with our carry-on luggage (ugh!) to be stowed beneath the seats. This later turned out to cause problems, because the aircraft on the last leg of our flight would not accommodate these large parcels and they had to be carried on our laps (a low point in the journey for Kay and Bebe, our XYL's!). Nevertheless, hand-carrying the transceivers was a good idea, because our checked luggage arrived in Grenada two days after we did. Our advice: hand-carry overnight toiletries and enough gear to get you on the air. On the return leg of the trip, hand-carry the logs!

The Trip

Departure day for our two-week vacation arrived and we left Houston early that morning bound for Barbados via Miami. Late that evening when we arrived in Barbados, we found that all of our checked luggage had been left in Miami. After the frustration of dealing with the luggage, we were pleased to find our hotel, the Crane Beach, to be quite enjoyable—although not the fanciest—and beautifully perched on a high cliff overlooking the south coast of the island. (The Crane Beach Hotel is an excellent location for a vacation operation because of its high elevation above the sea, close proximity to the airport, pleasant proprietors, and convenient roof and tree access for antenna installations.)

Upon arriving in Grenada, we went through an extensive security check and an even more extensive customs check. We spent some tense moments with the head customs official inspecting our transceivers and Grenadian licenses. Having those licenses in hand was an absolute necessity in our opinion. There had been a revolution in Grenada only three months prior to our visit, and airport officials appeared to be very cautious about outsiders coming in with sophisticated "short-wave" transmitting equipment.

Once outside the small airport terminal building, we were met by Rex Holder, the gentleman who was to be our guide, driver, and sage advisor. St. Georges is some



The HMS Golden Island leaving the port of St. Georges. JA4YDS was the radio operator on board.

20 miles from the airport (an hour's drive), and it was dark when we reached J3AO's QTH. When we arrived, we were met by our cook and housekeeper, Angela and Maggie, who greeted us with lots of friendly smiles and quickly got us settled. We were soon treated to some island hors d'oeuvres and a wonderful dinner. We unpacked what few things we did have, set up the IC-701, located the SB-200 and CL-33 feedline, and put one station on the air. (We were unable to use the FT-901DM because its power cord, mike, and keyer paddle were with the delayed luggage.) Our first contact was with Carlos, OA4CIT, in Lima, and the two of us shared the use of the single rig and continued operation through noon the next day when the balance of our luggage arrived.

Life on the Island

A typical day found us at breakfast at 8:00 a.m. All of our meals were served on the open back porch overlooking a deep jungled valley behind the QTH. Angela served only native food, all of which was very different from anything we had had before and quite delicious. Following breakfast we operated or took a swim in the pool, and on several occasions we went down to Grand Anse Beach for an ocean dip. The afternoons were set aside for more relaxing, and by late afternoon operating picked up. Usually we were in the middle of a large pile-up when supper was called. The cooks wouldn't hear of letting the meals get cold, so generally we had to leave late afternoon pile-ups hanging (sorry gang!).

Night-life on the island was limited, so evenings were spent at the QTH either operating or playing bridge. We were both night owls, so generally after the XYL's turned in we would operate into the wee hours.

One day we chartered a 42 foot ketch out of Spice Island Marina and sailed out into the open sea with the owners, Peter and his XYL, Sandy. (Interestingly, Peter and Sandy had sailed their craft from South Africa to Grenada via Brazil, and had met the French vessel with the PY0RO, St. Peter and Paul Rocks expedition, in Fernando de Noronha. Although



J3AO's beautiful QTH taken from its private swimming pool. Antennas are the Classic-33 and the Hy-Gain Hightower.

Peter and Sandy were not amateurs, they were familiar with the hobby and keenly interested in obtaining licenses.) We sailed past an old whaling station and around Pt. Saline at the south end of the island where the Caribbean and Atlantic meet. We then sailed north past St. Georges and into a lagoon where we snorkeled and ate lunch.

Visits

An interesting happening occurred following one night when George, J3ABP, stayed up all night working 15 and 20 meters. Bob, J3ABQ, had gone to bed around 0500 GMT. When Bob got up early the next morning, he went out the back door and was surprised to see two Japanese men approaching the house. Of course, he wondered what they were doing there, as the location of the QTH was quite remote from the town. At first he thought they were at the wrong address, but they insisted, in broken English, it was correct and they were to see George, who by this time was sound asleep! After inviting them in, Bob learned that the one gentleman was Yassy, JA4YDS, the "sparks" aboard the *HMS Golden Island*, and the other man was Captain Kim, the ship's captain. They had docked at St. Georges in the middle of the night with a cargo of 900 Japanese automobiles destined for a variety of Caribbean islands. While still at sea, Yassy had worked J3ABP and George had invited him up for an eyeball QSO. Bob roused George out of bed, and we had a nice visit over a pot of coffee. We had fun photographing each other, and since have exchanged photos, including ones we took of the

HMS Golden Island departing the harbor later in the day.

During our stay on the island we had two interesting visits with Grenadian amateurs. Len Ehrman, J3AO, came up to the QTH for an eyeball QSO. Len is quite a c.w. operator, and we will always remember him for his antenna farm; seems as though he uses an old hub-cap fed with a piece of coax as an antenna! We also had a most enjoyable visit with Don Atkinson, J3AH (now J37AH), and his XYL, Barbara. Their home is situated high on a hill with a spectacular view of the Caribbean to the west. Don is quite active with a Sea Scout program on the island, and has been instrumental in obtaining a fleet of small sailboats for the scouts.

Operation

Once all of the equipment arrived, we were able to get down to some serious operating. J3ABP was set up in the existing ham shack located in an upstairs bedroom. J3ABQ was set up outside on the downstairs veranda overlooking the St. Georges harbor.

We operated very heavily from about 2100 GMT daily and on into the nights, mostly with sizable pile-ups. Obviously, our most heavily worked bands were 20, 15, and 10 meters, respectively, with some 52% of the contacts on s.s.b. We generally tried to cover 40 and 80 meters from 0400 to 0600 GMT. One-sixty meter coverage was sparse, as we could only load the 80 meter dipole on that band. Operation on 40 and 80 meters was concentrated mainly on c.w. While working pile-ups on the high bands, we announced 40 and 80 meter frequencies to generate as much activity as possible. We tried 40 and 80 s.s.b. and did make a number of contacts; however, we invariably would get "trapped" into long ragchews which slowed down the rates, so we found ourselves going back to c.w. more often. Early evening (0100 GMT $\pm$) propagation on 40 and 80 was excellent to Europe with 40 sounding like a good 20 meter European opening from the states!

After we had adequately broken the ice on h.f., the 6 meter, 5-element beam was assembled and mounted on the side of the 50 foot aluminum tower which held the CL-33 tribander. The 6 meter beam was pointed, as best as we could tell, on Miami. The Yaesu FT-625 was put on the air using a Palomar wide-band preamp to beef up the receiver. An Autek keyer was programmed with a repeating CQ, and a beacon was established on 50.110 MHz.

The 6 meter rig was kept on every waking hour in hopes of catching a band opening which, at best, would be scarce for that time of year in the tropics. While working stateside stations on h.f., we repeatedly mentioned our 6 meter beacon. However, during the first week of operation we had no openings whatsoever. Our big hope was that during the upcoming weekend, which would be a stateside



George, K5KG/J3ABP, and Bob, W5SJS/J3ABQ.

Field Day with a flurry of activity, we would experience a band opening on 6 meters. This, in fact, proved to be the case, and on Saturday morning several stations were worked. From that point on we really kept a close watch on 6 meters, as we did not want to have struggled down there with all that extra v.h.f. gear and have only a few contacts to show for it. That night a good opening occurred and some 20 stations were worked. During the following week several more openings occurred, and our 6 meter tally was 67 contacts before going QRT. Interestingly enough, these contacts were all stateside and Canadian, none from the islands. We think this 6 meter operation was possibly the first ever from Grenada.

Both the Yaesu FT-901DM and Icom 701 transceivers performed well. The SB-200 also worked flawlessly, and gave

us a real boost when heavy QRM conditions prevailed. The Palomar wide-band preamps helped immeasurably on 6 and 10 meters and probably accounted for a great number of contacts with QRP and mobile stations which otherwise would have been missed.

Our operation went QRT on July 1 after about 7,500 QSO's, and we had a safe journey back to Houston. The inundation of QSL's was overwhelming, and it took us three months to clear the backlog.

What tends to make amateur radio so fascinating for us is constantly speculating and planning for the future: how to improve on the next antenna, how to make more contacts in the next contest, where to go for the next expedition, etc. Of course, we wonder if we will be accompanied on the next expedition by our XYL's!

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The 28th Annual CQ World Wide WPX Contest

S.S.B.: March 24–25, 1984

C.W.: May 26–27, 1984

Starts: 0000 GMT Saturday
Ends: 2400 GMT Sunday

I. Contest Period: Only 30 hours of the 48 hour contest period permitted for Single Operator stations. The 18 hours of non-operating time may be taken in up to 5 periods anytime during the contest, and must be clearly indicated on the log. Multi-operator stations may operate the full 48 hours.

II. Objective: Object of the contest is for amateurs around the world to contact as many amateurs in other parts of the world as possible during the contest period.

III. Bands: The 1.8, 3.5, 7, 14, 21, and 28 MHz bands may be used.

IV. Type of Competition: 1. Single Operator (a) All Band, (b) Single Band. 2. Multi-operator, All Band *only*. (a) Single Transmitter (only one transmitter and one band permitted during the same time period, defined as 10 minutes, no exception), (b) Multi-Transmitter (one signal per band permitted). **NOTE:** All transmitters must be located within a 500 meter diameter or within the property limits of the station li-

censee's address, whichever is greater. The antennas must be physically connected by wires to the transmitter.

V. Exchange: RS(T) report plus a progressive three-digit contact number starting with 001 for the first contact. (Continue to four digits if past 1000.) Multi-transmitter stations use separate numbers for each band.

VI. Points: Contacts between stations:

1. North America Only

A) Contacts outside of North America count 3 points on 28, 21, 14 MHz, and 6 points on 7, 3.5, 1.8 MHz.

B) Contacts with other North American countries count 2 points on 28, 21, 14 MHz, and 4 points on 7, 3.5, 1.8 MHz.

C) Contacts within own country count 0 points but are permitted for prefix multiplier credit.

2. Europe, Asia, Africa, Oceania, S. America

A) Contacts outside of own continent count 3 points on 28, 21, 14 MHz, and 6 points on 7, 3.5, 1.8 MHz.

B) Contacts with other countries on

own continent count 1 point on 28, 21, 14 MHz, and 2 points on 7, 3.5, 1.8 MHz.

C) Contacts within own country count 0 points but are permitted for prefix multiplier credit.

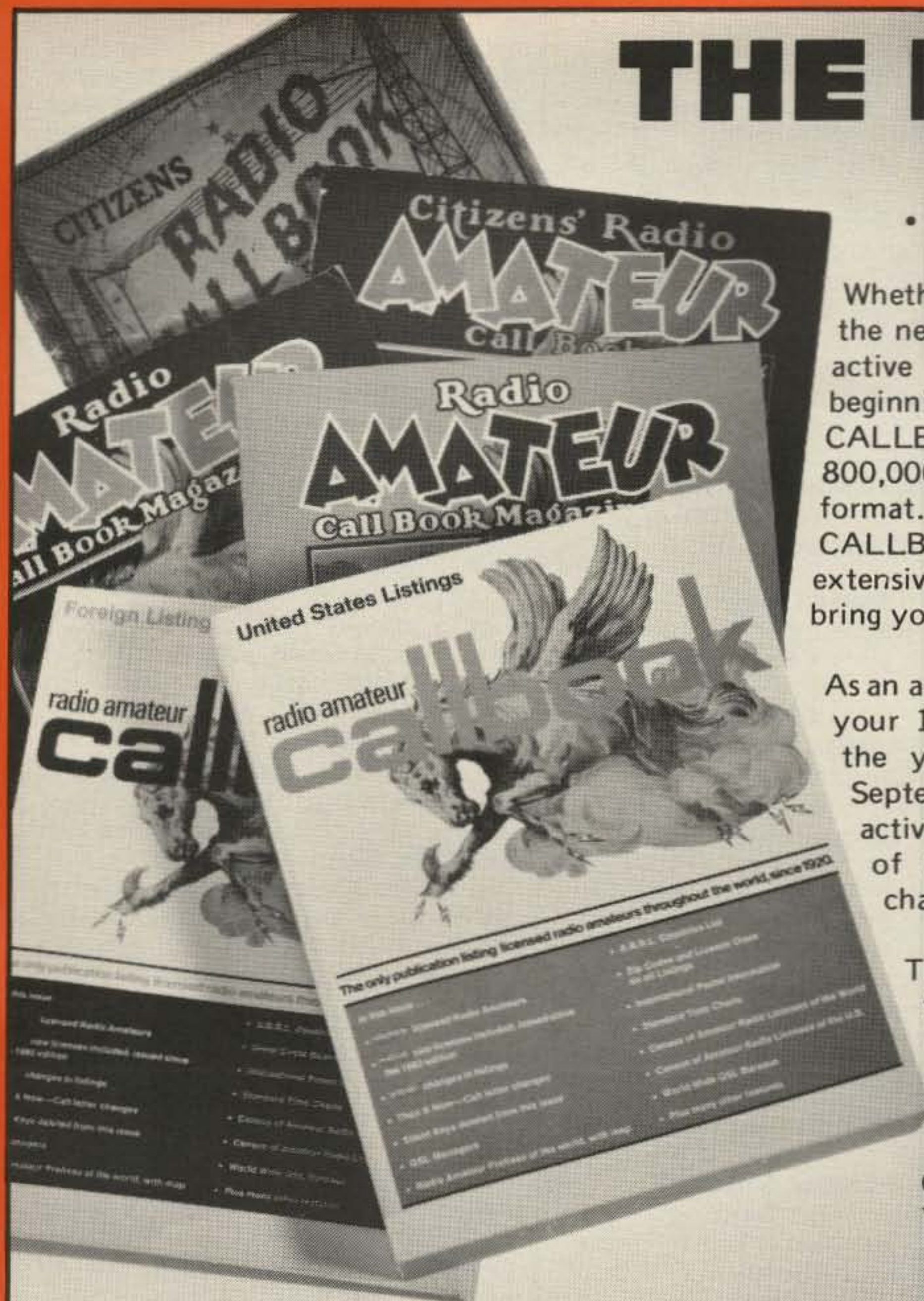
VII. Multiplier: The multiplier is determined by the number of different prefixes worked. A "PREFIX" is counted once during the entire contest regardless of how many times the same prefix is worked.

A "PREFIX" is considered to be the three letter/number combination which forms the first part of an amateur radio call (N1, W2, WB3, K4, AA6, WD8, 4X4, DL7, G3, IT9, KH2, AL7, NP2, WP4, 9M2, CT9, 4J9, PY7, VK4, JE3, VE3, Y32, Y33, Y45, AN8, AB8, H44, KT4, etc.). A station in a call area different than that indicated by its call sign is required to sign portable. The portable prefix would be the multiplier. Example: W8IMZ/4 would count for prefix W4 only and W8IMZ/LX would count for prefix LX0 only.

Special event, commemorative, and other unique prefix stations are also encouraged to participate.

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VIII. Scoring: 1. Single Operator (a) All Band score, total QSO points from all bands multiplied by the number of different Prefixes worked. (b) Single Band score, QSO points on the band multiplied by the number of different Prefixes worked. See VII.

2. Multi-Operated stations. Scoring in both these categories is the same as the All Band scoring for Single Operator.

3. A station may be worked once on each band for QSO point credit. However, prefix credit can be taken only **once** regardless of the number of different bands on which the same station and/or prefix has been worked during the entire contest.

IX. QRPp Section: (Single Operator Only). Power must not exceed 5 watts output to qualify for QRPp section competition. You must denote QRPp on the summary sheet and state the actual maximum power output used for all claimed contacts. Results will be listed in a separate QRPp section and certificates will be awarded to each top scoring QRPp station in the order indicated in Section X. These certificates will be marked QRPp and will show your power output. QRPp stations will be competing only with other QRPp stations for awards. All other information contained in these rules is applicable to this section.

X. Awards: Certificates will be awarded to the highest scoring station in each category listed under Section IV.

1. In every participating country.

2. In each call area of the United States, Canada, Australia, and Asiatic USSR.

All scores will be published. However, to be eligible for an award, a Single Operator station must show a minimum of 12 hours of operation. Multi-operator stations must show a minimum of 24 hours.

A single band log is eligible for a single award **only**. If a log contains more than one band, it will be judged as an all band entry, unless specified otherwise. However, a 12 hour minimum is required on the single band.

In countries or sections where the returns justify, 2nd and 3rd place awards will be made.

XI. Trophies, Plaques and Donors:

S.S.B.

Single Operator, All Band

WORLD - North Florida DX Assn.

U.S.A. - Bob Epstein, K8IA

CANADA - Garth Hamilton, VE2VY

CARIB./C.A. - Ray Alea, KC4OV

EUROPE - Bernie Welch, W8IMZ

JAPAN - Palm Garden Radio Club

SO. AMERICA - Ron Moorefield, W8ILC

WORLD QRPp - Dayton A.R.A.

Single Operator, Single Band

WORLD - John N. Reichert, N4RV

U.S.A. - Richardson Wireless Klub.

(Joe Johnson, W5QBM Memorial)

U.S.A. - 7 MHz - William Diggins, WA8LXJ

U.S.A. - 21 MHz - Ted Pauck, Jr., K8NA

CANADA - Gene Krehbiel, VE7KB

EUROPE - Myron E. Crofoot, WB4VQO

JAPAN - Ken Ruddock, K6HNZ

WORLD - 21 MHz - Lee Wical, KH6BZF

WORLD - 7 MHz - William Diggins, WA8LXJ

WORLD - 1.8 MHz - Arch Doty, Jr., K8CFU/4

Multi-Operator, Single Xmtr.

WORLD - Mike Badolato, W5MYA

Multi-Operator, Multi-Xmtr.

WORLD - Henry Thel, VE7WJ

U.S.A. - Bert Curwen, KL7IRT

Contest Expedition

WORLD - Northern Ohio DX Assn.

• • •

C.W.

Single Operator, All Band

WORLD - Canadian DX Assn.

U.S.A. - Steve Bolia, N8BJQ

CANADA - Canadian A.R.F.

EUROPE - Sig. Jakobsson, TF3CW

JAPAN - Palm Gardens Contest Club

WORLD QRPp - Nevada A.R.A.

(George Hewitt WB7OOQ Memorial)

Single Operator, Single Band

WORLD - Pedro Piza, Jr., NP4A

(Pedro Piza, Sr., KP4ES Memorial)

ASIA - Bruce Frahm, K0BJ

WORLD - 3.5 MHz - Lance Johnson Eng.

Multi-Operator, Single Xmtr.

WORLD - Ron Blake, N4KE

CANADA - Tehrahedral Contest Circle

EUROPE - Jonas Bjarnason, TF3JB

Multi-Operator, Multi-Xmtr.

WORLD - North Florida DX Assn.

NORTH AMERICA - Dick Weber, K5IU

Contest Expedition

WORLD - Northern Ohio DX Assn.

Club (S.S.B. & C.W.)

WORLD - Canadian DX Assn.

(Bud Abraham, VE1VR Memorial)

U.S.A. - Northern Ohio A.R.S.

Trophy and Plaque winners may win the same award *only once* within a **TWO** year period. This does not apply to any QRPp, Club, Expedition or CQ Special Awards. A station winning a World Trophy will not be considered for a sub-area award. That Trophy will be awarded to the runner-up for that area.

XII. Club Competition: A trophy will be awarded each year to the club or group that has the highest aggregate score from logs submitted by members. The club must be a local group and not a national organization. Participation is limit-

ed to members operating within a local geographical area. (**Exception: DXpeditions especially organized for operation in the contest and manned by members.**) Indicate your club affiliation. To be listed, a minimum of three logs must be received from a club.

XIII. Log Instructions: 1. All times must be in GMT. The 18 hour non-operating periods must be clearly shown.

2. Prefix multipliers should be entered only the **FIRST TIME** they are contacted.

3. Logs must be checked for duplicate contacts and prefix multipliers. Recopied logs must be in their original form, with corrections clearly indicated.

4. An alphabetical/numerical check list of claimed PREFIX multipliers must be sent along with your contest log. (A prefix is counted one time only.)

5. Each entry must be accompanied by a Summary Sheet listing all scoring information, the category of competition, and the contestant's name and mailing address in **BLOCK LETTERS**.

Also submit a signed declaration that all contest rules and regulations for amateur radio in the country of the contestant have been observed.

6. Official log and sample summary sheets are available from CQ. A large self-addressed envelope with sufficient postage or IRCs must accompany your request.

If official forms are not available, you can make your own with 40 contacts to the page.

XIV. Disqualification: Violation of amateur radio regulations in the country of the contestant, or the rules of the contest, unsportsmanlike conduct, taking credit for excessive duplicate contacts, unverifiable QSO's or multipliers will be deemed sufficient cause for disqualification. Actions and decisions of the **CQ WPX Contest Committee** are official and final.

XV. Deadline: All entries must be postmarked no later than May 10, 1984 for the S.S.B. section and July 10, 1984 for the C.W. section. Indicate S.S.B. or C.W. on the envelope. From rare isolated areas the deadlines will be made more flexible. Your support is appreciated.

Logs go to: CQ Magazine, WPX Contest, 76 N. Broadway, Hicksville, NY 11801 or to the **new** WPX Contest Director:

Steve Bolia, N8BJQ,
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50079	.032	88	4	2.47
50080	.032	175	8	4.57

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11304	18	.73	.66	.55
11305	20	.99	.90	.75
11306	22	1.12	1.02	.85
11307	24	1.25	1.14	.95
11308	28	1.52	1.38	1.15
11309	40	2.05	1.86	1.55

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11203	16	.16	.15	.14
11204	18	.18	.17	.16
11205	20	.20	.18	.15
11206	22	.22	.20	.18
11207	24	.24	.22	.20
11208	28	.28	.26	.25
11209	40	.40	.37	.33

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SINTEC Stock No.	ELPAC No.	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Dimensions (HxWxD) in inches	Price
13825	CB3801	3.0-7.0	12±0.6	0-25	48x51x3.05	\$ 7.95
13826	CB3811	3.0-7.0	12±0.6	0-25	48x51x3.05	7.95
13827	CB3802	3.0-7.0	15±0.7	0-20	48x51x3.05	7.95
13828	CB3812	3.0-7.0	15±0.7	0-20	48x51x3.05	7.95
13829	CB3804	3.0-7.0	28±0.7	0-10	48x51x3.05	7.95
13830	CB3814	3.0-7.0	28±0.7	0-10	48x51x3.05	7.95
1.5 W TYPE:						
13831	CL3801	4.0-7.0	12±0.6	125	65x11.2x1.77	\$24.95
13832	CL3811	4.0-7.0	12±0.6	125	65x11.2x1.77	24.95
13833	CL3802	4.0-7.0	15±0.7	100	65x11.2x1.77	24.95
13834	CL3812	4.0-7.0	15±0.7	100	65x11.2x1.77	24.95
13835	CL3804	4.0-7.0	28±1.4	50	65x11.2x1.77	24.95
13836	CL3814	4.0-7.0	28±1.4	50	65x11.2x1.77	24.95
13825-1	DATA SHEET FOR DC/DC CONVERTERS					

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Stock No. 13734 Price \$7.50

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Single Digit Displays - Common Cathode

Stock No.	Color	1	100
12082	Red	\$1.12	\$.99
12085	Green	1.84	1.63
12087	Yellow	1.92	1.70
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Stock No.	1	100
11010	\$1.24	\$.99

The Battery Just Wrap™ Tool

New battery powered tool wraps insulated wire around .025" square posts without need for pre-cutting and pre-stripping. Complete with bit and 100 ft. 30 AWG wire.

Stock No.	Description	Price
13340	Battery just wrap tool with bit and 100 ft. 30 AWG wire	\$49.95
13341	Replacement bit	9.95
13342	100 ft. blue replacement wire	6.95
13343	100 ft. white replacement wire	6.95
13344	100 ft. yellow replacement wire	6.95
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MINI-DRILL

This portable hand drill is appropriate for circuit board drilling. Runs at 2500 RPM on 4 "AA" batteries (not included). Supplied with one .039 dia. drill bit. Drill stand is designed like a drill press for precise hole drilling.

Stock No.	Description	Price
13346	Hand drill with .039 dia. bit (no batteries)	\$24.95
13347	Replacement bits: 2 each of .040 and .060 dia	5.95
13348	Drill stand	13.95

PIN FORMING TOOL

puts IC's on their true row to row spacing. One side is for .300 centers. Flip tool over for devices on .600 centers. Put device in tool and squeeze.

NEW! ANTI-STATIC MODEL Stock No. 10200 \$14.95
ONE TOOL DOES 8 thru 40 PINS! Stock No. 11059 \$12.95

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IC INSERTION/EXTRACTION KIT includes DIP IC extractors and inserters to accommodate all IC's from 14 to 40 pins. Tools that engage conductor surfaces are CARC safe and include ground no lugs.

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Stock No. 47005

8.8:8.8

Stock No. 47006

8.8:8.8

Stock No. 47007

Stock No.	Description	1	10
47005	3 1/2 dig. 5"	\$ 5.95	\$ 5.50
47006	4 dig. 5"	5.95	5.50
47007	4 dig. 7"	11.90	11.00

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Perseverance has made a 20 year dream come true for Ed Schaad, W3WDF. The 20 years seem to have been spent planning every last nut and bolt in his ultimate antenna system. Dreams sometimes become reality and most things are possible, as you'll find out reading Ed's account.

An Antenna System To Remember—Part I

BY ED SCHAAD*, W3WDF

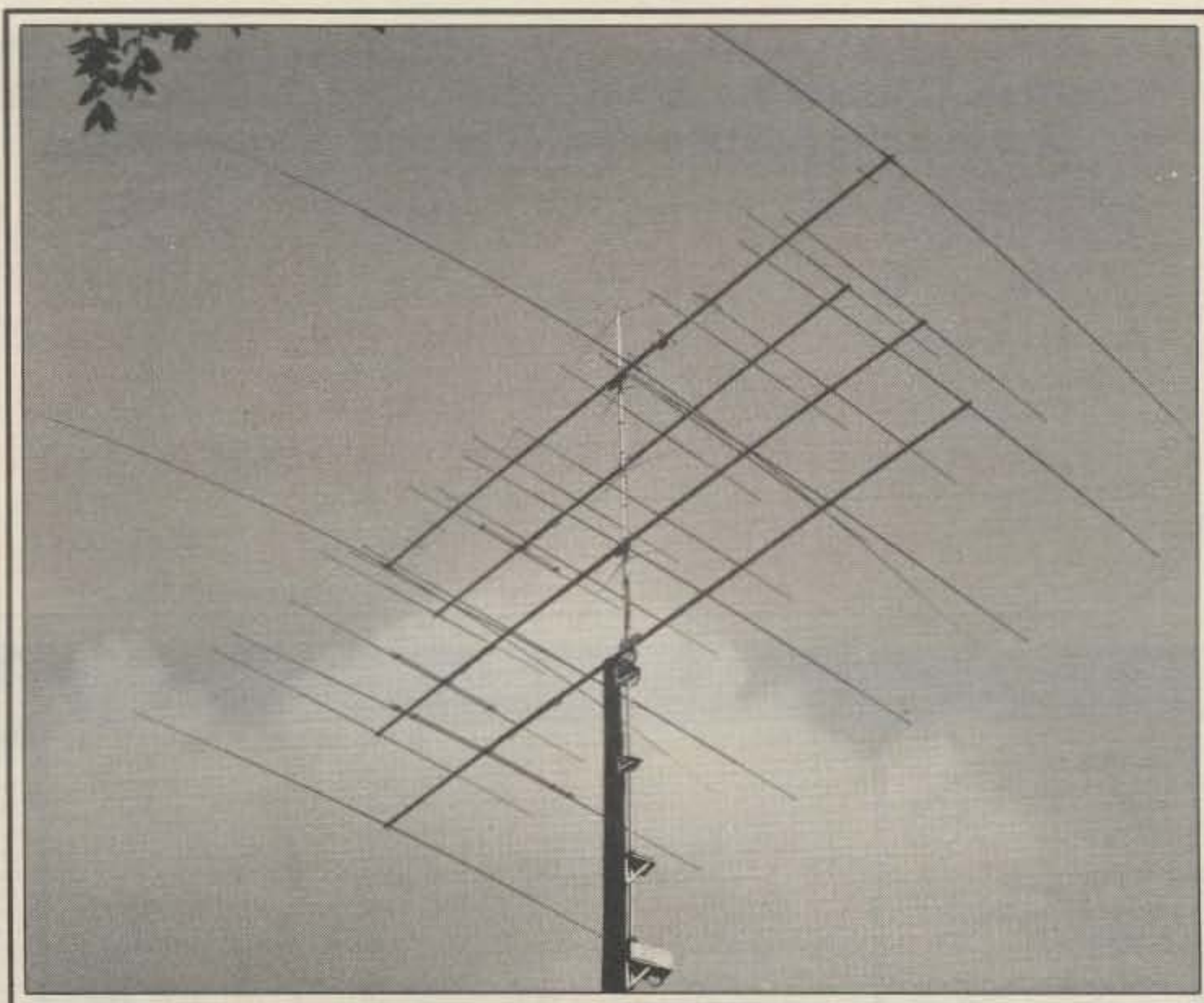
I've spent a great deal of my life on the eastern seaboard, i.e., eastern Pennsylvania, Maryland, Washington, D.C., and northern Virginia. Each time I moved I planned that each subsequent piece of property would have to be the ideal antenna site. All sorts of antennas were envisioned prior to each move. However, there were always the same constraints to be dealt with: the distance from work, location with respect to schools, accessibility, covenants regarding the property, restrictions within the development, limitations imposed by the county (for towers). Trade-offs. Always trade-offs were made, and severe ones. The net results were generally something for everyone, but not for the envisioned antenna system. Invariably there were mechanical and electrical trade-offs for some sort of contained antenna system configuration to make it fit within express limitations. At least there would be representation on the air.

This became the usual pattern of events. But haven't most of us had our tales of woe? Having spent 20 years with the Department of the Navy, it was high time to "pull that big switch." The XYL and I headed for the southwest. We settled deep in the heart of Texas on a little spread of three acres sandwiched between a couple of ranches. Don't think I didn't plan it that way! After having settled in, and disposed of routine matters, the planning for the most complete, practical, high-frequency antenna system, within budget constraints, began.

This presentation of facts, of victories and some defeats, hopefully will help someone else in the approach to installing a similar antenna system. The story unfolds in three major stages. The installation stage is divided into four significant phases to better understand the detail of sequences and the effort expended.

The Planning Stage

In determining the size and magnitude of an amateur radio antenna system envi-



Is it worth all the planning, work, and nervous energy? You bet it is when you can look up and see this antenna farm growing in your backyard. The end result of all this effort stands tall in San Antonio.

sioned to meet requirements of 100 feet (or over) and involving several multi-element beam arrays, there are important facets to be examined. Often work will commence before the total planning has been completed, and some undesirable trade-offs are required to complete the system. The following should be taken into consideration (not necessarily in the order listed):

- a. Location—available space for assembly and accessibility for heavy installation equipment.
- b. Noise threshold.
- c. Height of system desired.
- d. Bands to be served.
- e. Monoband vs. triband (or other).
- f. Element requirements.
- g. Technical performance, weight, and structural design of the beam array.

h. Length and diameter of the mast to meet average worst case wind loading on the beams.

i. Type and kind and positioning of radial and downthrust bearings.

j. Type and kind of rotator, control head, and the positioning within the system. Install at top, midway, or bottom?

k. Basic support system. Tower: rigid, foldover, nested, rotatable; guyed or non-guyed. If guyed, how many tiers? Size of cable, use of strain insulators, and nature of the ground anchors used. Use of a utility pole.

l. Environmental impact.

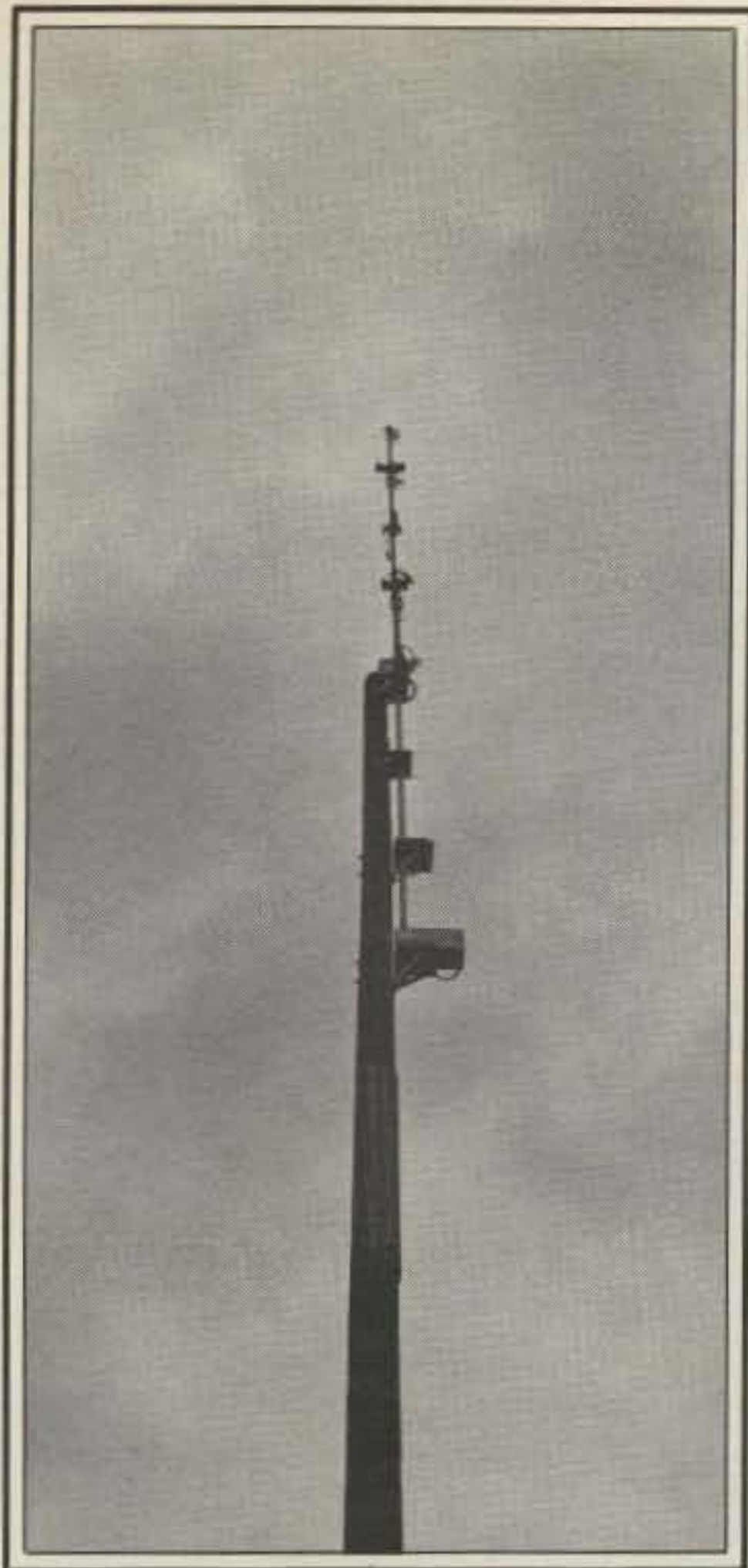
m. Ease of maintenance.

n. Kind of transmission lines. How long? Losses considered?

o. Safety requirements.

p. Cost constraints.

*Rt. 3, Box 771, San Antonio, TX 78218



The mast and pole prior to the antenna installation.

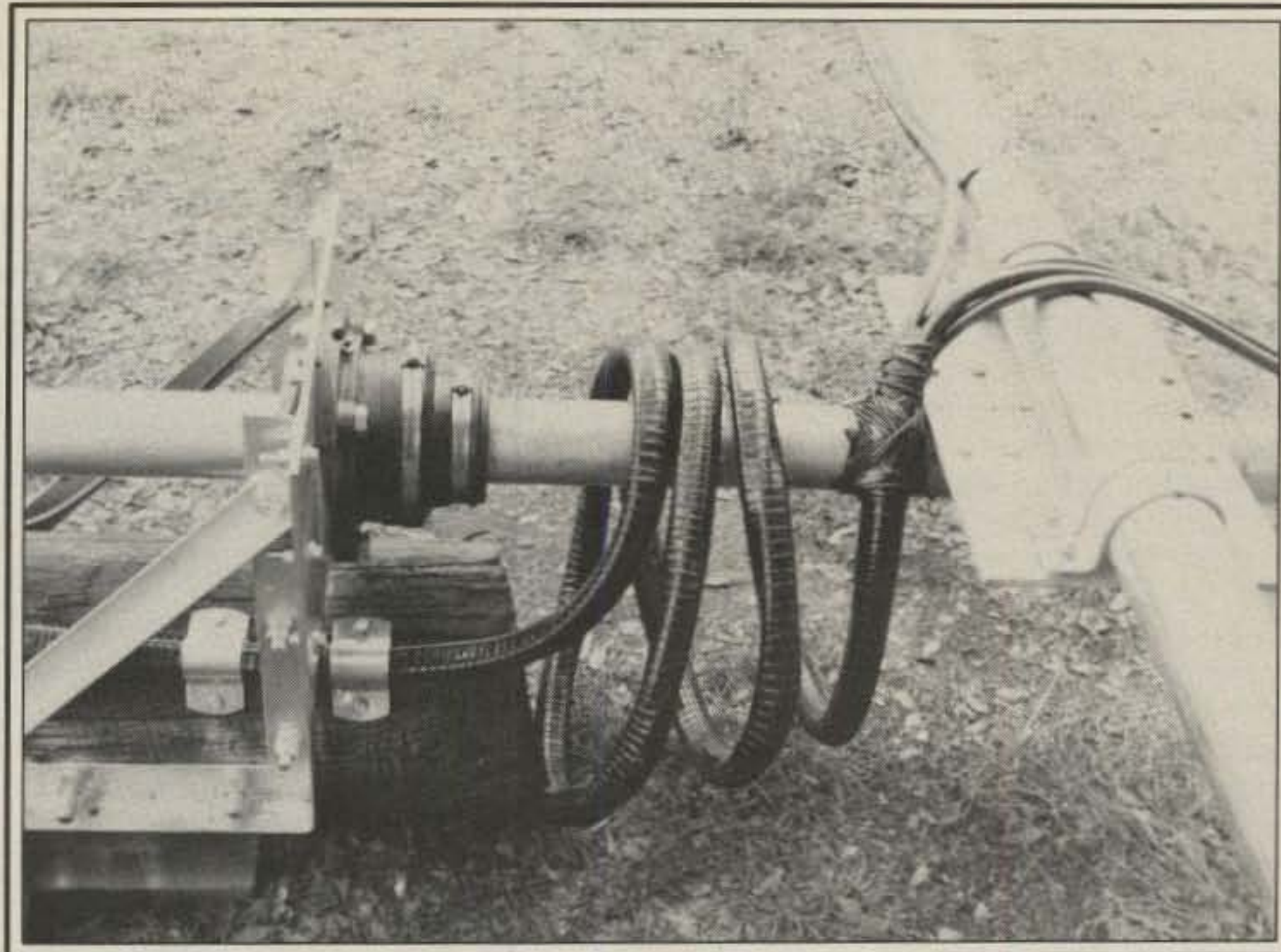
Record all findings and determinations. Make notes. Sketches are better than nothing at all. Highlight the interface to other related hardware. Make scaled drawings, if you prefer, as it will assist in ordering related hardware and cable.

In the case of the antenna system under discussion, all items above were ascribed to and a tentative decision point was determined for each.

Procurement Stage

When all of the considerations above had been ascertained and the physical approach was laid out on the drawing board, the search began for a supplier of Yagi beams and related hardware. Meanwhile, a few examples of problems, unanticipated happenings, and trade-offs were revealed from experience in the particular installation. It was determined to go the utility-pole route, having studied the popular approaches. The utility pole would be more acceptable to the environment. Poles are normally strong, accessible, and maintenance free. The bearing shelves, plates, bearings, and rotator would be easy to install. The mast could be installed on the ground and would be easy to align. A dry run for the mounting and positioning of the gussets could be accomplished. When these work operations could be accomplished on the

A close-up view of the coaxial loops as described in the text. The rugged construction techniques leave nothing to chance.



ground, the aerial installation time would be cut in half or better. (Much of the same ground functions may be applied to certain towers.)

The hardest problem to cope with was the availability of a Douglas Fir utility pole, which was used in this case. The requirement was for a 100 foot "stick." Searching the metropolitan area (San Antonio) for a supplier was a difficult task. All those contacted indicated that to obtain the 100 footer, it would have to be shipped from Washington or Oregon at an unattractive transportation cost. I was determined to find something locally, and after two days of exhausting search, an electrical contractor who maintains his own pole yard and stock was found. Upon close examination of the poles, an 82 foot, straight as an arrow Douglas Fir was found. It had a 23 inch butt and a 11½ inch head. Beautiful! The first major trade-off was made without regret. After some negotiations, the contractor agreed to sell the pole, transport it to the site, bore the 24 inch hole 14 feet in solid limestone, and set the pole in a phased cost and operational plan. That was a windfall! However, not so for the contractor. Upon delivery, he didn't take into account the narrow secondary ranch roads and the sharp turns at junctions that he had to cope with pulling the extraordinarily long pole trailer. He made it after pulling down two corner fences and flattening a through-highway stop sign. All this, of course, he had to restore.

It was determined that with a shorter than 100 foot pole much of the altitude could be made up with the larger and stronger masting. This would also permit increasing the spacing between beams. But what about the mechanical stress of

the mast at the increased height? After much discussion with a mechanical engineer and a metallurgist, it was definitely decided to go to the 3 inch diameter, .250 wall, 1026 DOM (drawn over mandrel) for a total length of approximately 46 feet. This would accommodate 4 Yagi beams, 6 el. on 10M, 8 el. on 15M, 6 el. on 20M, and 3 el. on 40M, all of which would be installed with an excess of 6 feet of spacing between beams. It also was determined to install four mast bearing shelves, instead of three as originally planned, offering the uppermost security and stability to the extra long mast under adverse wind loading conditions. (The local area has infrequent 40-50 m.p.h. gusts.) That was a "trade-up" but where could a mast section of 46 feet be found? How could it be shipped? After much telephoning across the state, a supplier of steel tube was found in Houston. Requirements were discussed, specifications cited, and the company agreed to hand pick and match two tubes to equal a total of 46 feet. They had to be junctioned if the intent were to be served. As it turned out, two mast sections, 1026 DOM, one at 24 feet and the other at 23 feet 11 inches, were sent. Along with that they sent a 3½ inch OD x .250 (3 inch inside dia.) x 4 foot long sleeve and a 6 foot long steel inner tubing 2½ inch OD x .250, all of which were seamless 1026 DOM, and would be the junctioning material. This solved the running length and transportation problem. But has anyone ever tried to junction exact (with inherent tolerance) mating dimensions?

For the next few days we made a search for a machine shop capable of performing the machine work required to precision fit the steel 6 foot inner tube

within the mast junction and precision fit the outer 4 foot sleeve over the mast junction. We found it. It was the Industrial Machine Works Co. They specialize in the repair and fabrication of parts for oil drilling equipment and pumps. They had the lathe beds to accommodate the 24 foot masts. Was this job too small for them? It was a gamble. Other shops declined to accept the task, for their lathe beds were too short. But after the initial meeting we discovered that the superintendent was also a car-buff. After a thorough discussion of the Ford Model "A" and a few other cars, he agreed to help. The next problem was the transportation to the shop. An 18-wheeler had delivered the masts to the QTH. The masts were too long and much too heavy for carrying on a pipe rack on a $\frac{3}{4}$ ton pick-up bed. Therefore, a 20 foot low flat-bed trailer was rented, and the tubing was taken to the machine works 35 miles away. They fitted those masts so close that an allowance in dimension was made for the anti-seize compound placed on the fitted surfaces.

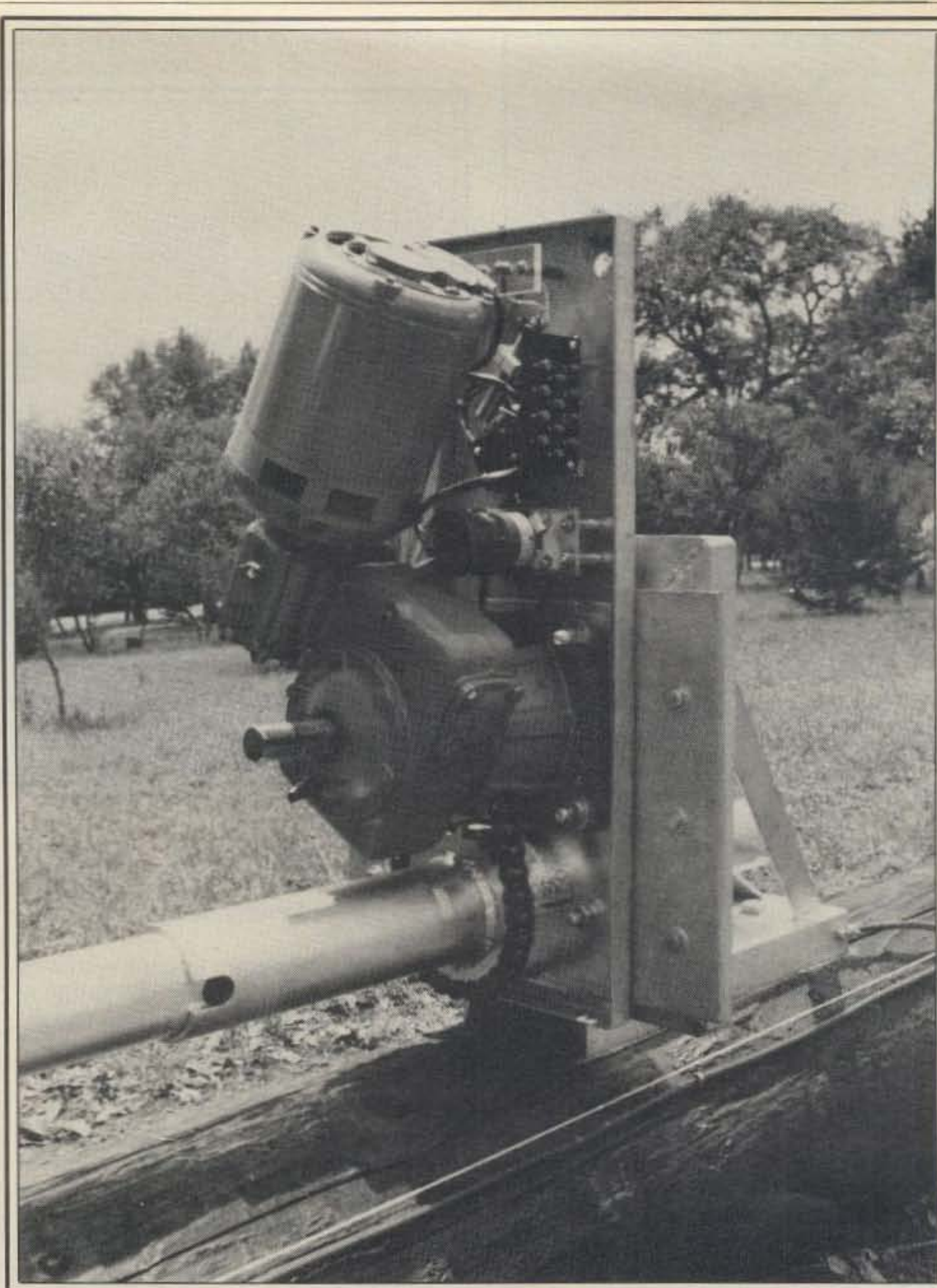
In selecting the beams, a study was made of available data and specifications from the various manufacturers. The objective was to obtain the highest forward gain (notwithstanding the front-to-back and side ratio) regardless of the number of elements and the structural qualifications to withstand wind loading peculiar to the specific area. No consideration could be made about stacking phased arrays because of the design approach already chosen.

The Telrex antennas were selected because of gain figures obtainable and the rugged and sturdy physical features of the long monoband Yagi beam array.

Several rotating systems were checked, but none could compare to the potential of the Telrex BA2899RIHS three-stage torque-transfer-type gear box utilizing a chain-driven sleeve accommodating the 3 inch mast subsystem. It has a rotating torque of 18,000 inch-pounds, output shaft speed of .5 r.p.m. powered by a $\frac{1}{2}$ h.p. reversible motor, all with a total net weight of 145 pounds. The rotator is mounted on a $\frac{3}{8}$ inch galvanized steel plate on an angular shelf mounting bracket. The rotator is covered by a watertight, all-welded (seamless), steel box cover. Regency hydraulic fluid was substituted in lieu of regular nondetergent motor oil for the gear box. The assembly also contains a heating element which is thermostatically controlled.

Installation Stage

The installation stage must be divided into four phases to appreciate the magnitude of effort and impact upon the whole of the product. These are: (1) Ground preparation and installation of support hardware; (2) drilling the hole and setting the pole; (3) installation of transmission lines; and (4) aerial installation. I completed the first phase. The second, third, and



The heavy-duty Telrex rotator assembly. It looks like it will turn just about anything.

fourth phases were performed by two separate contractors.

Ground Preparation Phase

This phase provided the nucleus for all stages of the master plan. All things were dependent upon the success of the ground installation work.

The Douglas Fir was placed near the site in such a manner so as to be level when measured with a spirit level. This offered a basis for calculations and measurement for layout, alignment, and drilling the holes for the bearing shelf brackets. Great care was used in drilling the holes for the long through-bolts which secure the shelf angle-brackets to the pole. The shelf-brackets have to be mounted as precisely as possible at right angles to the surface of the pole (allowing for the amount of taper from the point where the rotator is to be mounted to the top end of the pole). This operation can be accom-

plished with the use of a machinist's "C" clamps securing the steel bearing plate to both right angle supports and then tightly positioning the angle supports around the diameter of the pole. Align the shelf with a carpenter's square and compensate for the degree of taper. If necessary, temporarily nail the brackets to the pole. The top horizontal edge of the steel bearing plate should be true level. When the first shelf is installed, it then becomes the standard for positioning and alignment for the rest.

The mast bearing support subsystem consists of the top radial bearing, manufactured by Borg-Warner, mounted on a $\frac{1}{4}$ inch steel plate. It contains ball bearings, a zerk fitting for lubrication, and it is weather sealed. The next lower shelf contains a "dampening" bushing of about $\frac{3}{4}$ inch brass mounted on a $\frac{1}{4}$ inch steel plate. This is to keep the mast from oscillating (yielding) as a result of high wind

pressures exerted on the array above the radial bearing. The next lower shelf is a commercial-grade down-thrust taper roller bearing, prelubricated and sealed. Directly on top of this bearing is a heavy-duty 3 inch ID split-collar locked tightly to the mast. The combination, collar over the bearing, rests on a $\frac{3}{8}$ inch steel plate. About $\frac{1}{8}$ of the down thrust total weight of the masting, gussets, and antenna array, which is estimated at about 800 pounds, is carried at this point. The last (bottom) shelf is $\frac{3}{8}$ inch steel plate and is furnished with the rotator. The rotator is designed to carry all the weight. However, it was decided to have the rotator carry approximately $\frac{1}{8}$ of the total load.

Next came installing the rotator. A debate ensued as to the installation of the rotator on the pole on the ground or in the air. There are risks both ways. On the ground the rotator may be damaged when lifting the pole or damaged when setting the pole. In the air, while the crane could raise up the mast for inserting the rotator into position, the 145 pounds would not be easy for a man to handle from the suspended cage and perform the final alignment procedures. It also would require drilling and securing the steelplate in the air. It was decided to mount the rotator on the ground and be extremely cautious in raising the pole. Time was a major factor, and time on a large crane rental means dollars. Installing the rotator on the ground was a cinch. The $\frac{3}{8}$ inch plate was placed and secured with the machinist's clamps. It took two men to carry and hold the rotator in position while the third inserted the mounting bolts, securing the rotator to the plate. The rotator, mounted in a temporary vertical position, was no real threat. The lubricant stayed properly in the two gear box compartments, for the pressure relief valves were of the spring-loaded ball-check type and they retained the fluid intact. Since the rotator was of the chain-driven sleeve coupler to mast type, it was easy to align. Great care had to be exercised in setting the pole to avoid impact on the rotator.

Next came the tedious job of inserting the first mast section into the radial bearing. The singular mast section was so heavy to manage (by one person) that it had to be *bushed* and held upward on three brick pedestals, the end of the mast facing squarely into the mouth of the radial bearing (the mast was floating vertically in the radial bearing). The mast was progressively moved through the radial bearing and on through the brass bushing (dampening) bearing with slight adjustments to the shelf plates by adjusting the "C" clamps. Like adjustments were made to the down-thrust bearing plate and the rotator plate, all the while keeping the measurements of the mast parallel with the plane of the pole and adjusting for allowances for pole taper.

Once the mast was aligned and level,

the task of drilling and securing all bearing plates to the pole angle brackets began. Six holes per plate were spotted (three to a side) and the drilling started. The holes were drilled through both the plate and the angle bracket supports while the "C" clamps held the positions. Plates were fastened with $\frac{3}{8}$ inch steel hex head bolts.

The rotator, on the bench, was set at 0 degrees looking straight down the middle of the weather box forward. The limit switches had been set to open at CW 190 degrees and CCW 170. These were the early steps in beam orientation. The next step was to adjust the mast through the driven sleeve of the rotator. A $\frac{3}{8}$ inch hole was drilled through the mast to capture the rotator sleeve. A $\frac{3}{8}$ inch steel pin was driven in and locked with cotter pins. For the junctioning of the second half of the mast, the inner steel tube and the outer sleeve were already in place as done by the machine shop. Again the brick pedestals came into use to support an even heavier section with the junction couplers in place. This touch-and-go operation took time insofar as the friction of the inner and outer surfaces had to be overcome as the mast sections were mated. The predrilled holes in the coupler had to line up with the holes toward the top end of the lower mast. The upper mast end was pounded with a large, heavy rubber mallet which moved the upper assembly gradually into place. (The precision fit is extremely important, as the sleeve junction is above the top radial bearing and is subject to wind stress.)

Once the second mast was junctioned and bolted into place, the final spacing between the beams could be established and the mast marked for each beam position. Since orientation of the rotator was set at 0 degrees, pointing outward in the middle of the weather box, the flat end was temporarily facing upward and had to be level to establish accurately the 90 degree positions of the gussets with respect to the plane of the ground. This, of course, was done horizontally and vertically with a spirit level. This automatically preset the booms to a 0-180 degree condition with respect to the rotator. However, before securing the gussets into position as described above, a "dry run" was made by temporarily installing all four booms within their gussets; boom dead center markings were made on the gusset plate and coincident markings were made on the boom. The measurement and preparation of the steel wick-wire boom struts were made with reasonable accuracy.

Last but not least, the four transmission lines of RG-8/U were prepared with three loops at the radial bearing level. The lower loops were secured to the top of the pole and fitted with Type "N" connectors for subsequent connection to Andrews LDF4-50 hardline. The three-loop radius was adjusted, and the upper

loop was bonded to the mast about 18 inches above the radial bearing. From this point the coaxial cable was permanently dressed up the mast and secured about every 18 inches along the way. At each gusset level a coaxial cable was temporarily secured to the respective boom and brought to an accurate termination point where the driven element was to be fed and the terminal lugs of the coaxial balun were to be secured. Special coaxial cable lugs were installed on the axial and shield ends of the cable. They were taped and moisture proofed with 3-M weather compound. As the cables were progressively secured up the mast, the distribution was made and handled in the same manner. The cables were then detached from the booms, rolled into loops, and temporarily bound to the mast at the respective gusset levels. The strut cables were treated in the same way.

It is important to note the manner in which the three loops at the radial bearing were established. Each of the four coaxial cables was drawn through a length of new $\frac{1}{2}$ inch vinyl nylon-reinforced low-temperature garden hose. The four hose-clad coaxial cables were then bound together in a square-like configuration looking at the end view. They were tightly taped together and tied over the initial taped layer with linen cable lacing cord with the lock stitch method. The assembly was then taped tightly over the cable cord, and a generous coat of clear lacquer was sprayed on the finished product. Each end of each hose was taped to the coaxial cable and 3-M moisture-proof compound was applied. The three loops were then formed and secured. This provided a suitable strain relief for the cable for beam rotation and guarded the cables against tangling and chafing should they drag against the radial bearing plate.

All booms were removed from their gussets, and the gussets were adjusted to 90 degrees in line with the calibration of the rotator and mast.

(To Be Continued)


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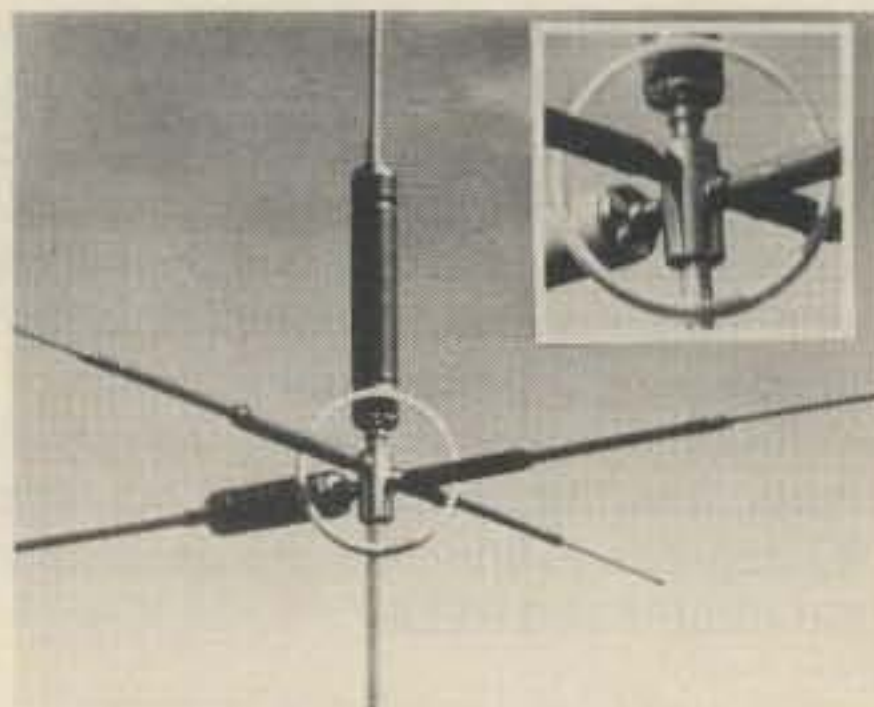
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Ends: 1600 GMT Sun.**

It has been decided to continue with the new rules format put into effect last year. Some of the changes were well received, while others created a mixed reaction, most notably the elimination of the QSO number in the exchange. We have conceded, however, that it will not be necessary for DX stations to spell out their QTH; their call will identify their country (it is recommended, however, that only standard prefixes be used in their calls).

The suggestion we made last year that the "DX Window" be extended to 1835 kHz did not produce any results. The Europeans who are not permitted to operate below 1830 kHz, especially the U.S.S.R., continued to operate on frequency and did not use the advantage of split-frequency operation (we still think it's a good idea).

It is still essential, however, that the "DX Window" (1825 to 1830 kHz) be kept free of U.S. and VE activity. DX stations using the "Window" should always indicate where they will be listening.

In any event, we feel that any changes should be given more than a one-year trial period. It takes a couple of years to get the word out worldwide.

Classes: Both single operator and multi-operator (maximum of 5 ops per station).

Exchange: RS(T) and QTH. State for U.S., province for Canada (not necessary for DX to spell out their QTH).

Scoring: Contacts with stations within own country, 2 points. Contacts with stations in other countries but in the same continent, 5 points. Contacts with stations in other continents, 10 points. (KH6 and KL7 are considered countries.)

Multiplier: Each U.S. state, VE province, and DX country. (U.S. and Canada are not country multipliers.) There are three VE1 provinces: New Brunswick, Nova Scotia, and Prince Edward Is.)

Final Score: Total QSO points times the sum of the multipliers (U.S. states + VE provinces + DX countries). Maritime mobile scoring will be determined by the location.

Penalties: Three additional contacts will be deleted from the score for each duplicate, false, or unverifiable contact removed from the log. A second multiplier will also be removed for each one lost by the above action.

Disqualification: Violation of the rules and regulations pertaining to amateur radio in the country of the contestant, violation of the rules of the contest, unsportsmanlike conduct, or taking credit for excessive duplicate contacts or multipliers will be deemed sufficient cause for disqualification.

Disqualified stations or operators may be barred from competing in future CQ contests for a period of up to three years.

Awards: Certificates to the top scorers in each class, in each U.S. state, VE province, and DX country.

There are six plaques as follows:
U.S.A.—C.W. and S.S.B.—Donated by the West Gulf A.R.C.

Europe—C.W. and S.S.B.—Donated by Don Busick, K5AAD.

World C.W.—Charlie O'Brien, W2EQS Memorial—Donated by Frank Anzalone, W1WY, and Bernie Welch, W8IMZ.

World S.S.B.—John Doremus, W0AW Memorial—Donated by "Friends of W0AW."

The above plaques may be won once only by the same station within a three-year period. Winner of the World Plaque will not also be considered for a sub-area award. That award goes to the runner-up of that area.

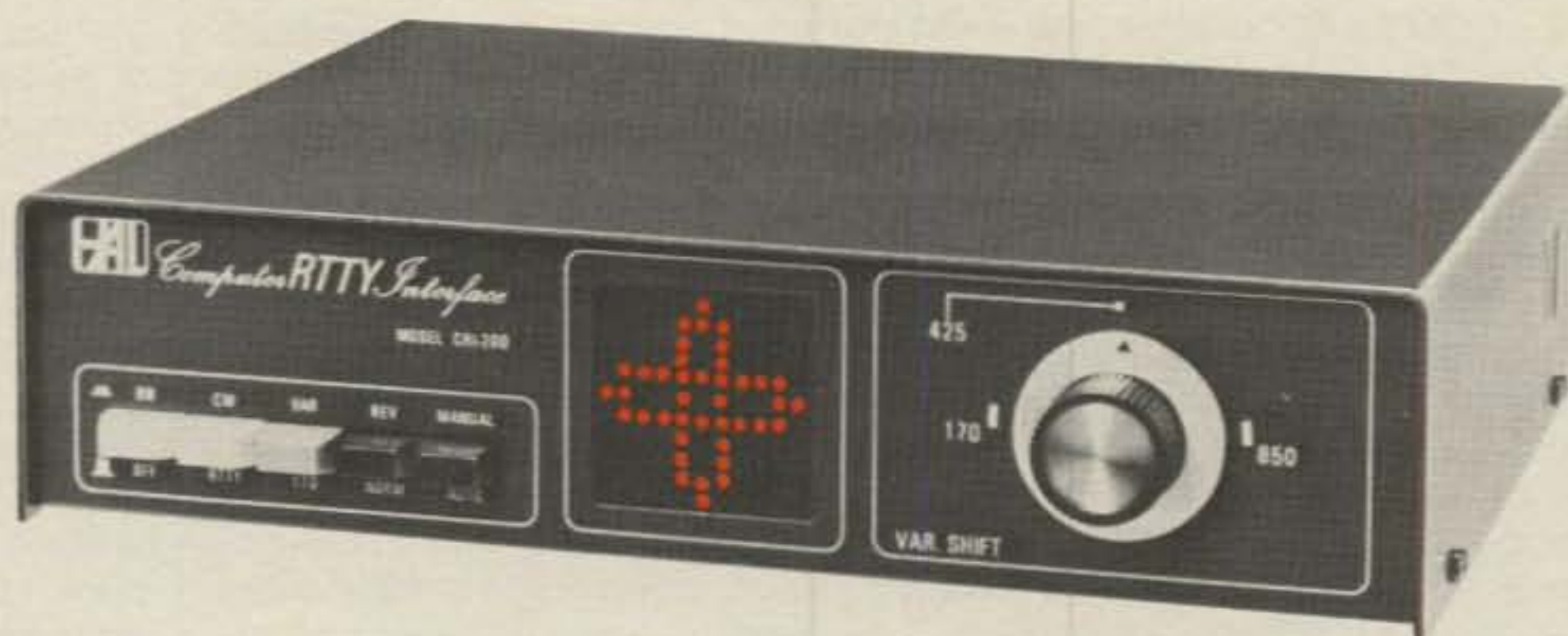
Sample log and summary sheets may be obtained from CQ by sending a large s.a.s.e. with sufficient postage to cover your request. It is not necessary to use the official forms. You can make up your own, 40 contacts to the page, time in GMT, and columns for exchange sent and received, multiplier, and QSO points. Indicate the multiplier only the first time it is worked.

Include a summary sheet with your entry showing the scoring and other essential information, and a signed declaration that all rules and regulations have been observed. Mailing deadline for c.w. entries is February 28th, and March 31st for the s.s.b. section.

Logs can be sent directly to the 160 Contest Director, Don McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32901 USA. They can also be sent to CQ 160 Meter Contest, 76 North Broadway, Hicksville, NY 11801 USA. (Please indicate c.w. or s.s.b. on the envelope.)

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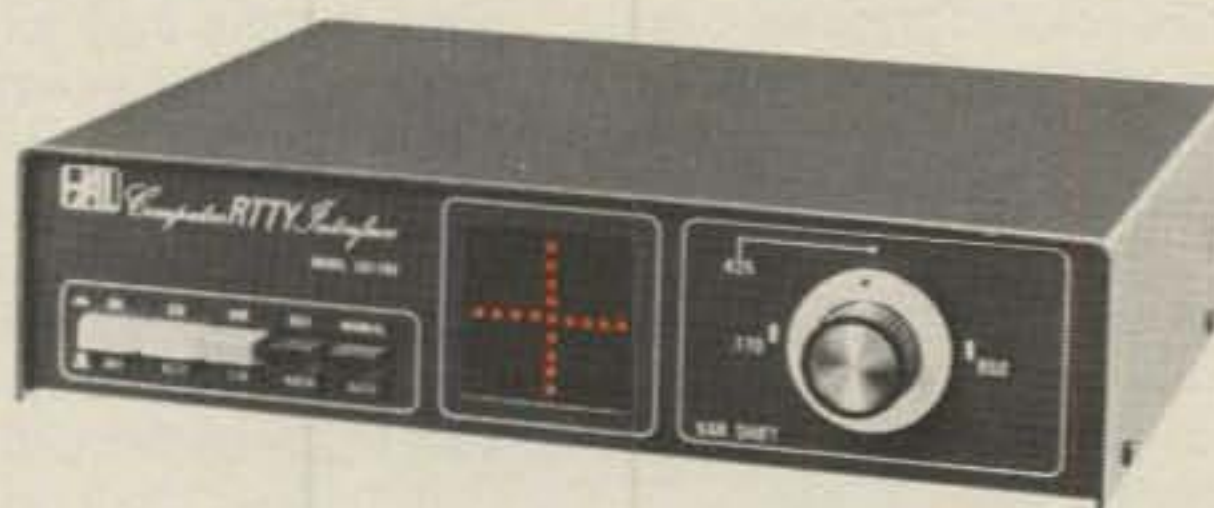


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THE ART OF VERY LOW POWER OPERATING

The Return of Operating Reports

It has been quite a while since I shared some of the many interesting QRP operating reports that I frequently receive from readers of CQ's QRP column. As I've noted before, the QRP handbook has taken most of my time for the past three years. But finally, it's done! It's rather hefty, and now Al and Dick are faced with the task of putting it to press. The tentative title is *The QRP'er's Guide to Feedlines, Antennas, Propagation, and DXing*. In addition to the subjects mentioned in the title, the handbook takes the beginner through everything he needs to know about setting up a QRP station, putting up a good antenna, and mastering the fundamentals of successful QRP operating in various types of activities. Included are sections about operating in QRP QSO parties, Field Day, 160 meters, DXing, contests, and mobiling, as well as the routine variety of QRP operation. Strategies for matching objectives and operating techniques with antennas and propagation are outlined in detail. An entire chapter is devoted to the special challenge of QRP DXing and DX contesting. Two big chapters about the details of propagation serve as a foundation for discussions of operating techniques. I wish I could say that this book is a relaxed evening's reading, but I can't! We'll leave that to other books about QRP.

Over the years, I've gotten a sense of what QRP operators—both newcomer and veteran alike—know, as opposed to what they need to know to solve their operating problems. There aren't any easy answers in QRP. I've tried to write a book that will repay hard study with the information necessary for successful and enjoyable QRPing. Like QRP itself, a worthwhile book about QRP can't help but be challenging! More about it later.

Many readers have asked about the absence of operating report columns during the past couple of years. Apparently, that type of column is (or was) quite popular. I like them, too! So, let's dig back into the mailbag for some interesting reports from the past several years and see what the gang has been doing. I'd like to start off with a really old report written in 1979 in response to my account of how I got started in QRP. Mike Musslen, WB8JJA, wrote:

"While we've probably never met on

the air, after reading your QRP column in CQ magazine I felt like telling you how much I enjoyed the article about how you got started in amateur radio. I guess the main reason I liked the article so much was because I felt you put into words just what ham radio means to me. Perhaps that also holds true for many other hams.

"I got started at about the same age with the same collection of junk radios. By junior high school, I was an avid s.w.l. and competed with a couple of classmates in logbook contests, winning one after I learned to receive the code. The next step was inevitable—going after the Novice ticket. In 9th grade I met up with a Russian teacher who just moved into the neighborhood and had a ham station. I got him to send code to me once a week, and one day he announced that I had passed the code test. The license finally arrived in March 1971, and I learned that I was WN8JJA. I'll never forget that day!

"My first rig consisted of a borrowed National NC-125 receiver (circa 1952), my own Ameco 15 watt transmitter, and a borrowed vertical antenna. The transmitter was almost exactly like your first homebrew rig. It used a 6V6 as the oscillator and final, had plug-in coils for 80 and 40 meters, and had an octal socket for the crystal. I had one crystal at 7164 kHz, which was a bit too close to a foreign BC station. I got out with it, though, and one night, way past midnight, I worked a WN6 in Lompac, CA.

"The next step was a rig to put me on 15 meters. It was homebrew and mostly built from junk TV sets and ham friends' junkboxes. Like you, I never had to ask for a single part due the generosity of the ham community. The whole thing cost \$20 and ran a whopping 75 watts. After a summer or two of lawn-mowing jobs, I bought a Drake 2B receiver, which really put me in business.

"I'll never forget those times. Looking back, I think they were the most enjoyable and exciting years of the hobby. I still enjoy ragchewing on c.w. and building my own gear, but I'll never part with that first homebrew rig and the 2B. I just graduated from the U.S. Merchant Marine Academy and have had a chance to visit many of the places I worked on the ham bands. They could only exist in my imagination then. I always carry along an HW-7 QRP rig when I go to sea. I've been able to operate /MM on a few ships, and I always listen around the bands on the other ships. You would be surprised at what a couple of watts can do out here.

Well, Ade, one other thing your article did was convince me to upgrade my ticket. I figure if I can get that Extra, it will be like starting all over again in ham radio. Most of all, I hope someone comes to my door someday asking for help to become a ham."

Yes, Mike, helping other guys get started is sharing another "beginning" in ham radio. Your letter is appreciated and strikes a chord in me because of the shared memories. It's nice knowing that other hams traveled the same beginner's route as I, and the similarity of details is striking. When I started on the QRP handbook, I felt the need to explain to interested readers about the fascination I felt for radio (and still do!), so I took that old story ("How It All Started—the K8EEG Story") and built it into the first chapter of the book. Oddly enough, your ending comment touches one of my most cherished experiences as a ham—when I helped a bunch of youngsters at summer camp qualify for their Novice tickets. Being around their excitement and enthusiasm was really inspiring—but the story is in the book and no sense in retelling it here. On with the reports!

de John P. Tenikat, WA9BFV, Benld, IL: "Just a note to tell you how enthused I am about QRP operation. For the last two days, I have been using a borrowed HW-7 and having a ball with it! The first QSO I had with it was KL7Y on 20 c.w. using a ground-mounted vertical with radials running on top of the ground. I got a 449, but with the 1 watt output, I'm not complaining! The record now stands at 8 states, VE3, ZF2, and VP2S. I'm surprised that the DX stations could hear the peanut whistle above the din of the CQ WW DX Contest! Got a 599 from a Novice in NY on 15, which bolstered my ego considerably. On 40, I had a nice QSO with Terry, WB9WGM, who does quite a bit of QRPp work with an HW-8 and an Argonaut. His enthusiasm was so infectious that now I'm trying to work a trade for the HW-7. If you know of any mods for this rig, please let me know of them. I have the issue of QST in which DeMaw presented three mods, but I am especially interested in one for putting RIT in the receive section.

"I've enjoyed reading your QRP column in CQ. Though this is my first attempt at QRP, I've gained a lot of knowledge about this mode of operation from you and your correspondents to the column. I now understand your thrill with very low-power operation."

If I recall correctly, DeMaw's mods

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were the chief treatments of the HW-7, although a few minor items appeared in QST's "Hints & Kinks." If anyone out there has references to HW-7 mods, especially RIT, drop me a line and I'll pass along the info.

de Joe Heyde, WB7TNH, Great Falls, MT: "Thanks much for your prompt return of your booklet of HW-8 mods. You asked some questions about my mods, so here goes. The receiver preamp that I installed is from Digitrex Electronics, as per their ads in CQ magazine. It covers 0.5-30 MHz and is well worth the \$8.95 price. It works so well that I bought another for an old homebrew receiver, and it sure perked up 10 meters on that receiver. The S-meter circuit is from QST's "Hints & Kinks," Nov. 1979, p. 57. With the S-meter in the audio circuit, plus the preamp on the front end, the audio gain needs only to be opened a little bit to give mid-scale reading on the HW-8 output meter. A 599 signal produces a mid-scale reading easily, and I intend to put in a 'damper' to cut it down some. I find that the preamp works equally well on all bands in the HW-8.

"One other thing I did to the HW-8 was to change the r.f. amplifier, Q1, on info from WD8MBU. He recommended substituting an RCA SK3116 for the original Q1, but I used a GE-FET-1, since no RCA was available locally. It did some good. Before I sent for your mods, I put together the RIT mod from Jan. 1971 QST. It 'works' after a fashion, giving me about 1 kHz, and the spot switch doesn't make much difference, so I'm not satisfied with that mod. Also, I remounted the HW-8 'wide-narrow' audio filter switch on the rear panel, wanting to keep the unit 'as is,' and then I turned around and bought an Autek QF-1A c.w. filter. Never had a filter like that before either! What with its amplifier, it sure perked up the signals both on phones and speaker. I added a Digitrex counter kit to my TS-820, and it spoiled me, so I'm waiting for another to put with the HW-8. Have been getting a kick out of the mods, and also began building some projects from scratch just to learn more about electronics and building, etc. Thanks again, and I'll be looking forward to more columns and especially to your QRP handbook coming soon—we hope!"

de Rob Magro, KA2EGO, Milford, NJ: "Hi! I am 17 years old and have been licensed as KA2EGO for about 11 months. I have been using an Argonaut 509 and have found this small QRP rig to be very exciting. As of yesterday, I worked my last state using only 5 watts and a CB vertical antenna. I am now applying for WAS QRPp. So far I have worked 26 countries with the 509, and I can't wait to get DXCC QRPp in the future. The key word in QRP operation is 'patience.' I know the world can be worked very easily with patience, and a true QRPer never gives up. So, all you beginning QRPer out there, don't give up. It just takes time!"

de Dr. Bob L. Tn. Berge, ON4QX, Antwerp, Belgium: "I hope you and the gang will welcome me as a contestant for the DXCC QRPp Trophy. I read the article about DXCC QRPp in the Nov. 1981 CQ, and that was the starting point for my quest for the award. With QRO, I have worked 355/317 (missing BY) on c.w., and over 1600 WPX, and I became a little fed-up with this kind of DX work. So, I bought an Argonaut and started yesterday, without believing that I could work out of Europe without a kw and 6-element beam. Well, to my surprise, I worked SM7 (599), OH3 (579), UA1 and UA9 (599), and then suddenly a K4 (579) and then HK0BKX! I could hardly believe that! The antenna is a Hy-Gain tribander for 20-15-10.

"Will you please let me know some details about the DXCC-QRPp Trophy rules? Must the other station mark on his QSL that I am QRP? (Ed.: No.) Do you have any special form for the application? (Ed.: No; what is required is a log list, in alphabetical order by prefix, of the 100 qualifying QSO's, along with QSL's for the same. Include date, time, band, mode, call, and report.) What is the cost of applying for the trophy? (Ed.: At present, a \$24 application fee applies to help cover partial cost of the handsome trophy, shipping, etc.) Any special rules to follow? (Ed.: Yes. With respect to 'list' or 'Net' DX QSO's, the QSO is valid only if the DX station copies the QRP station's callsign and report exclusively and directly from the QRP station. So, if you get on a list or check into a net to work some DX, be sure that your call is not announced to the DX station. Request that the NCS or list-control simply announce that a QRP station will call next.)

"In closing, I must admit that I was of the erroneous opinion that I needed a kw to work some DX stations, but this is the end of that kind of QSOing for me! I have sold the linear and QRO equipment! I have been a ham since 1936, starting again in 1953, and work only c.w."

Carl, WA3SEE, writes: "Have been enjoying your column for sometime now, and became an on-the-air QRP enthusiast three months ago. Rig is an Argonaut 509 and Drake SSR-1 receiver. My apartment location limits antennas to indoor dipoles on 15 and 20 meters, and a very short random wire for 40. So far I've worked 17 states and VE—so far. I was a technician when my QRP operation began, but I upgraded to Advanced a couple of weeks ago, so I have more 'room' now. Had big plans for working QRP phone, but I don't do as well as on c.w. I listen a lot, and answer loud stations that are calling CQ (seems there are more of these on c.w. than on phone; most of the phone people seem to be 'calling on schedule' for a specific station). Even so, the upgrade to Advanced has permitted me to get on 20 meters and it is a really nice band. I listen around 14040 kHz and 14060 kHz a lot, and 21040/21060 kHz if

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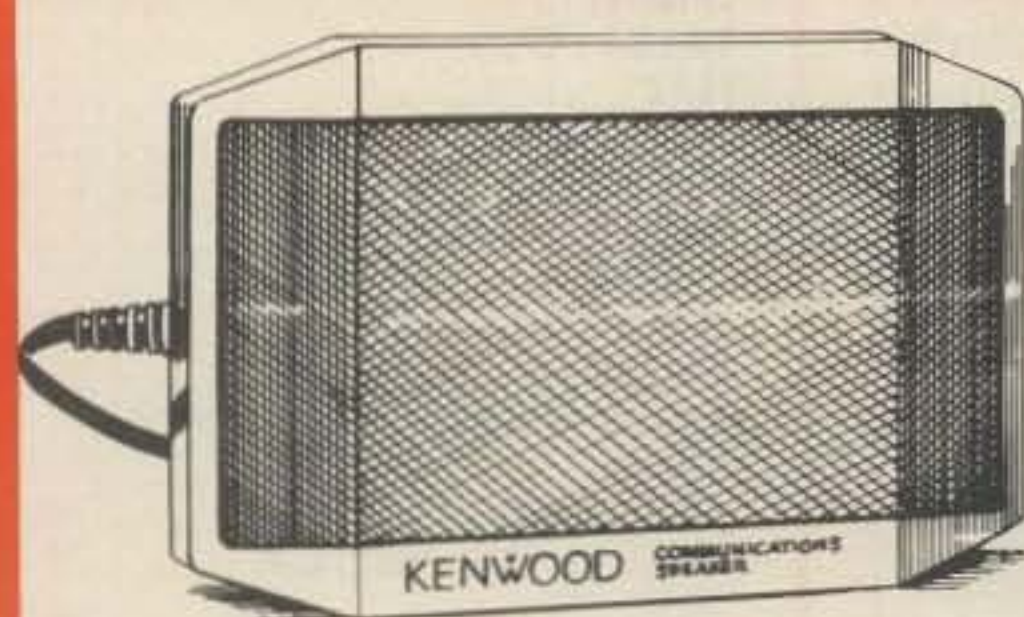
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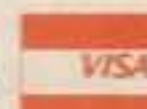
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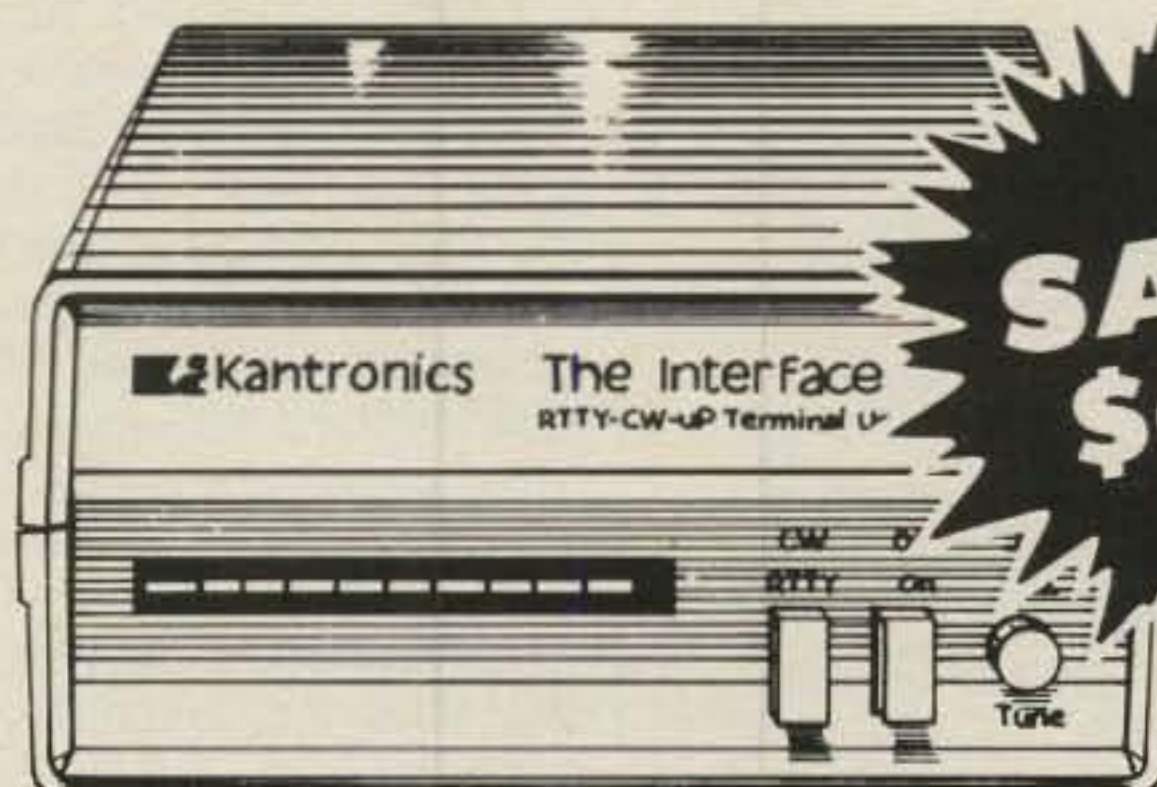
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15 seems to be holding up. I find it interesting that in the few months I've been on, I've never heard a 'CQ QRP' or worked another QRP station!"

I find that interesting, too, Carl. I hear that comment frequently, but for the life of me, I can't admit to the same experience. I believe that the problem can be traced to QRPers applying that old axiom about never calling CQ and always listening and answering other stations' CQ's. Now that axiom certainly holds true away from the QRP calling frequencies (3060, 7040, 14060, 21060, 28060 kHz), *but not on the QRP calling frequencies*. If all QRP operators simply monitor the QRP calling frequencies, just who is supposed to do the CQing? As I suggest in the QRP handbook, QRPers should adopt the practice of tuning to the QRP calling frequency every time the rig is turned on, checking to see if another QRPer is calling CQ QRP, and if not, going ahead and giving at least three CQ QRP calls. Just one call is inadequate; other guys monitoring the calling frequency have to find you first! I know that if this were adopted as a universal practice, multitudes of QRP two-ways would result.

I can't remember the last time I tuned to 7040 or 14060 kHz and was unable to raise another QRP station. But, it took some fine tuning after my CQ QRP to dig the responding stations out of the mud. I recall one W6 on 40 in the evening. I'd raised an AZ QRP followed by W7 in Washington, and I thought I'd give another try in case my CQ's had caused an unobtrusive pile-up on frequency. Sure enough, there was the W6, extremely weak and about Q2. We managed to get across all the necessary info in about 20 minutes. Turns out his dipole was only up 10 ft.! No wonder! But that's what you have to deal with on the QRP calling frequencies! Call CQ QRP at about 12 w.p.m. in three strings of 4 x 3's, and then carefully tune 2 kHz above and below your transmitting frequency. RIT is important because this ± 2 kHz tuning approach is utterly essential. So, let's see if this approach doesn't produce considerably more QRP two-ways after this column appears in print. But back to the mailbag for a final report. Seems that I just can't keep my comments short now that we're back into this type of column!

de Ed Hall, AF3S/2, Oxford, NJ: "I wanted to write and thank you for being the one to finally get me started building my own equipment. Your article on the regulated power supply was the most intelligently written construction article I've ever seen. (Ed.: Thanks!) It prompted me to drag out an old, broken, unregulated Radio Shack supply and repair it, adding your regulating circuit. It works like a charm. That gave me the confidence I needed.

"I'd been off the air for about 9 months due to a lack of finances and antenna space. I was about to buy another HW-8

and start operating again when I saw a letter in the QRP ARC I newsletter (I'm QRP #4289) telling of all the projects in the ARRL's *Solid State Design for the Radio Amateur*. Dragging out my almost-untouched copy, I saw he was right. After staring at it with glassy eyes for a while, I decided to try the simple 2-stage crystal-controlled rig for 40 meters. It went together nicely, and I took my life into my hands and applied power, having already pessimistically dubbed it the 'AF3S super transistor-destroyer.' Amazingly, it worked well, with only a slight problem with modulation of the carrier from an optical coupler I had installed in my key-CPO circuit to enable me to have a sidetone. This was cured with an electrolytic capacitor across the key leads to the transmitter, and then I had a clean output. The rig only produced 0.8 watts output (18v peak-to-peak across a 50 ohm dummy load with a calibrated scope), but I attribute that to my output transistor (RS 276-2030).

"So then I put it on the air, hampered by using an old Hallicrafters receiver (broad as a barn in the selectivity department), with no results on the first day. I couldn't even spot my transmitter's frequency! Lo, the second day I raised Ontario, Virginia, and New York. A friend then loaned me a 33-year-old National receiver, and I was off and running. The next day I got two more New Yorks and a Massachusetts, and today (at 3 a.m.) I raised Arizona! I was going to try a better transistor to boost the output, but since I'm doing so well on less than a watt (using a dipole of unknown s.w.r. at 15 ft.!), I guess I'll stay with it and try for WAS Milliwatt.

'Now I'm planning a similar rig for either 20 or 15 meters, depending upon what kind of crystals I can come up with at Sunday's Reading Hamfest. I'll follow that with a keyer and a receiver, and maybe a v.f.o. like your design in Nov. 1979 CQ. Then a v.f.o. transmitter. I don't want to buy anymore rigs, now that I've caught the building bug!"

Well, gang, that's space for this month. Hope you've all enjoyed hearing from some of the QRP gang. Let's get the reports rolling in again with some photos included. What with the excellent conditions of the past three years, there ought to be loads of experiences and information to share with the gang!

Next I'll be catching up on what's happened in the world of DXCC QRPp and DXCC Milliwatt since the last report. the list of DXCC QRPp Trophy qualifiers has stretched to 56 (and believe it or not, I've been waiting for my 100th QSL for 3 months now!), and an amazing eight QRPers have qualified for the DXCC Milliwatt Trophy! So things have really been happening during the peak and post-peak months of Cycle 21, and there's still a lot of DX to be worked before we hit the bottom of the cycle!

73, Ade, W0RSP

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3
4
4
4
6.2/9.8/9.1/8.8
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2.0:1 or better adjustable
2.0:1 or better adjustable
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2
3
3
3
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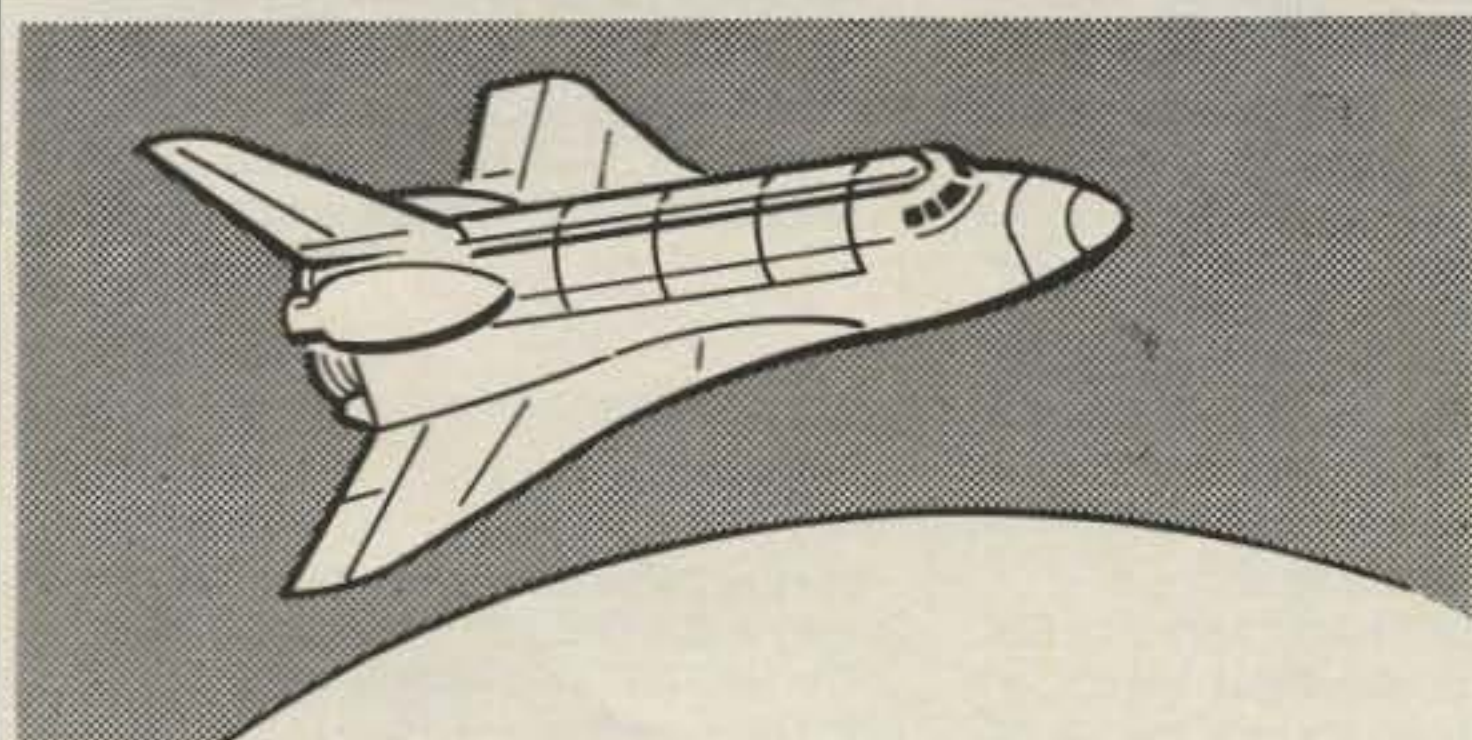
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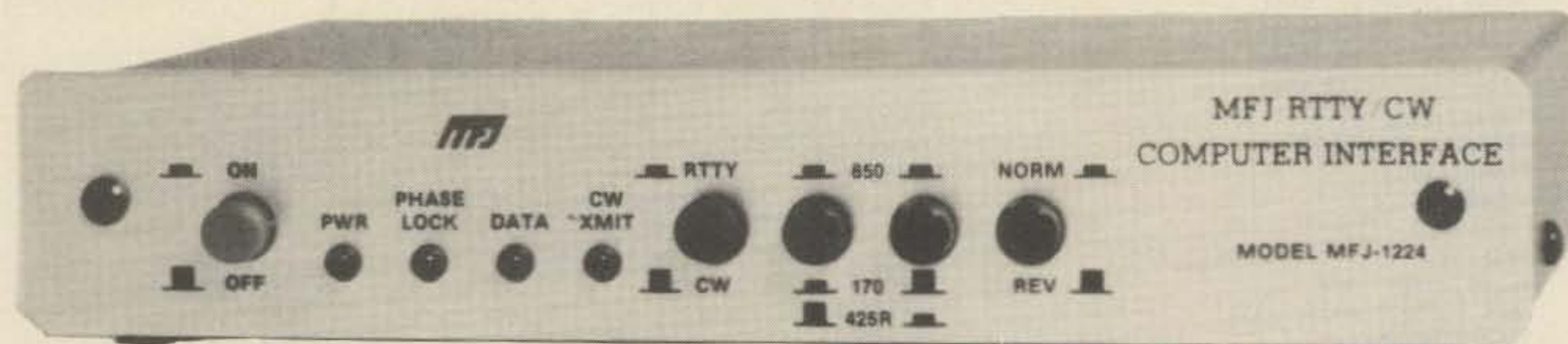
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DESIGN, CONSTRUCTION, FACT, AND EVEN SOME FICTION

This and That

This month's CQ column ranges across the board with a wide variety of antenna topics, including followup on previous antenna column features. We believe you'll find this an interesting presentation that touches on many bases.

Last month in our "Reader Report" feature we used some incoming mail as a point of departure to present a variety of antenna and tower construction ideas. We also made note of some correspondence that took us to task for some advice we provided in the column, and we presented a simple but useful Quad antenna design program for the popular Vic-20 personal computer.

This month we will provide some additional information received from WB3GXV on his interesting tower which we profiled in last month's issue, and we'll take a second look at the Windom antenna. We also will make mention of a simple shirt-pocket "J-Pole" for 2 meters, highlight some new antenna products, and take note of the Ham Pet Users Group (HAMPUG) and its activities.

First, a followup on the WB3GXV tower described in last month's CQ.

More on the WB3GXV Tower

In last month's column we described Ed Long, WB3GXV's rock-solid roll-over tower, on which he installed a Quad built from an earlier published CQ article (April 1982). Ed passed along some additional information to us about the Quad's construction details; these were received too late to insert conveniently in the previous column, so we will summarize them here. The essentials of Ed's addenda are as follows:

1. *Background on the tower.* Having decided to build the Quad and wanting a tower that was easy to erect, of sturdy construction, and safe, too, he decided that the only reasonable way to assemble the antenna was to have the tower in a horizontal position about 15 feet above ground. This prompted him to design a hinge arrangement secured to the side of a Rohn 25 G tower (but with no holes drilled in tower members). The tower proper is made up of five 10 foot sections of Rohn 25 G and one 8 foot section of Rohn

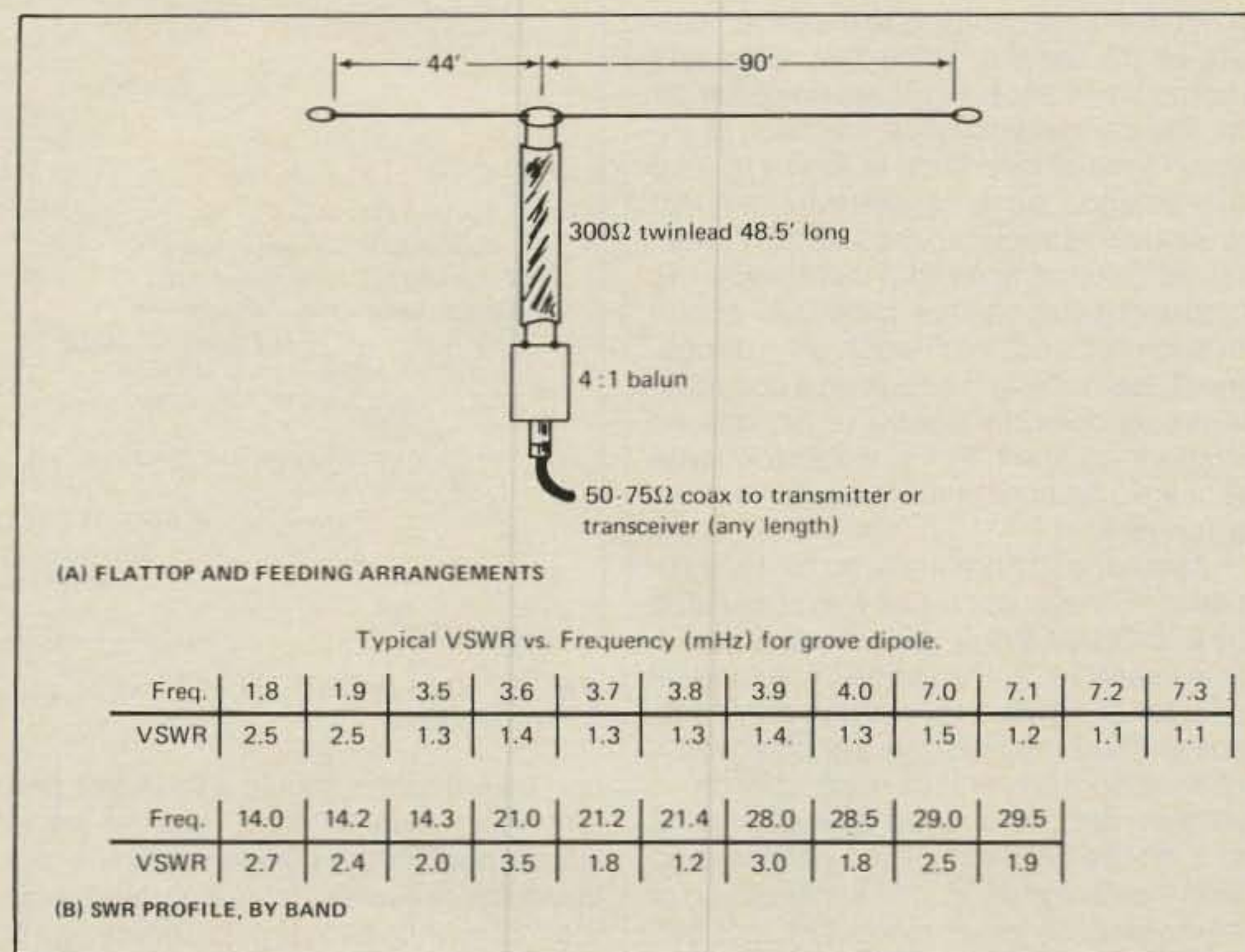


Fig. 1— Modified Windom for 15 meters. (Source: Monitoring Times, May-June 1983.)

HD-73. In the horizontal down position the tower rests in a cradle made of 4 x 4 timber 15 feet long. The timber is bolted to an angle iron secured in a concrete base. The top of the cradle has a 2 x 4 which forms a "tee" on which the tower rests (see photo series in last month's column).

2. *Cost.* The cost of materials going into the tower, exclusive of the Rohn sections and guying, approximated \$425. The direct costs totaled \$385, including:

- Two winches rated at 2,000 lbs., with handbrake, and having a gear ratio of 12.5:1—\$98.
- Miscellaneous structural steel, pipe, and aluminum—\$88.
- Steel cable and miscellaneous fittings—\$117.
- Cement, gravel, and sand—\$60.
- Hardwood for the hinge pad and treated wood for the cradle—\$22.

3. *Dimensions.* The roll-over tower is 58 feet from the base to the top of the Rohn tower, with an additional 10 foot mast up to the hub of the quad. (The assembly has been in place for more than a year with no wind-load problems, despite wind gusts to 55 m.p.h.)

Ed believes that the level of detail and overall outline presented is adequate for

the reader to adapt the tower to his own desired situation. Conversely, if the tower height requirement is under, say, 40 feet, he sees no need for many of the structural braces, the A-frame locking bar, and the backup winch. However, for those interested in the design, Ed is willing to provide sketches. His address is 9801 Watts Branch Dr., Rockville, MD 20850.

The Windom Revisited

An h.f. antenna that waxes and wanes in popularity, but one that never truly "dies," I have found, is the venerable Windom. The original design was appropriately named after the amateur, Loren Windom, W8GZ, who developed it and wrote it up for publication in the 1930s. Not seen much in its original "off-centered Hertz" configuration, the antenna is simply a half-wave flattop (at the lowest operating frequency) which is fed at a point about 15% from the center with a singlewire feeder of convenient length. However, contemporary versions substitute 300-600 ohm twinlead or openwire line for the singlewire feeder.

The nominal 300-600 ohm feedpoint impedance of the Windom allows a fairly good match to twinlead and openwire line on all even harmonically related bands.

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Getting good results is little problem on 80, 40, 20, and 10 meters with the even-order relationships involved. A typical flattop dimension is about 137 feet, with the feeder tapped at a point 20.5 feet (15%) off center. If 80 meter operation isn't important, an antenna length of 68 feet can be used to work 40, 20, and 10 meters; in this case, the feeder is tapped at a point about 10 feet off center.

The Windom normally doesn't do much for the amateur who wants to operate on 15 meters, since the necessary harmonic relationship does not exist on 15. The solution usually envisioned to enable 15 meter operation is simply to feed the antenna as a randomwire against ground. This requires the use of a wide-range antenna tuner that can handle the high input impedance expected at the transmitter end. With such an arrangement, feeder length becomes a consideration, as does the quality of the ground system; too often, "r.f. in the shack" type problems are encountered with such an arrangement.

Another and potentially far better solution to 15 meter operation was postulated by Bob Grove, WA4PYQ. He was primarily in search of an "all band" coax-fed dipole for shortwave monitoring purposes, but which also would give a good account of itself on transmitting, especially on 15 meters. Bob did a good deal of pruning and on-the-air testing, and he came up with the design of fig. 1A. It makes use of an empirically determined 134 foot flattop which is fed through a relatively short (48.5 foot) 300 ohm matching section and a 4:1 balun transformer, with coax of any convenient length being used for the main run to the hamshack.

Bob reported good results with the antenna in the May-June 83 issue of *The Monitoring Times*, his in-house Grove Enterprises publication, and at his forum at the 1983 Atlanta HamFestival. S.w.r. does run a little high at a few points (for example, 3.5:1 at 21.0 MHz, 2.7:1 at 14.0 MHz, 2.5:1 at 29.0 MHz, and 2.5:1 on 160 meters—a "bonus" band). However, the figures cited are extremes, and don't look greatly different from s.w.r. figures which might be encountered using an ordinary dipole on band edges. Fig. 1B depicts the s.w.r. figures Bob found on each band, 160 through 10 meters.

We would like to learn of the results obtained with this antenna, especially on 15 meters. Also, would anyone care to scale down the modified Windom to half-size dimensions, sporting 22 and 45 foot legs? We'd like to hear of results with the mini-Windom, too.

The 2-Meter Shirt-Pocket J-Pole

We've written before about the good performance and low cost of the so-called J-pole antenna for omnidirectional v.h.f. and u.h.f. work. Fig. 2 shows a sketch of a handy "shirt pocket" 2 meter version of the J-pole antenna. This type of

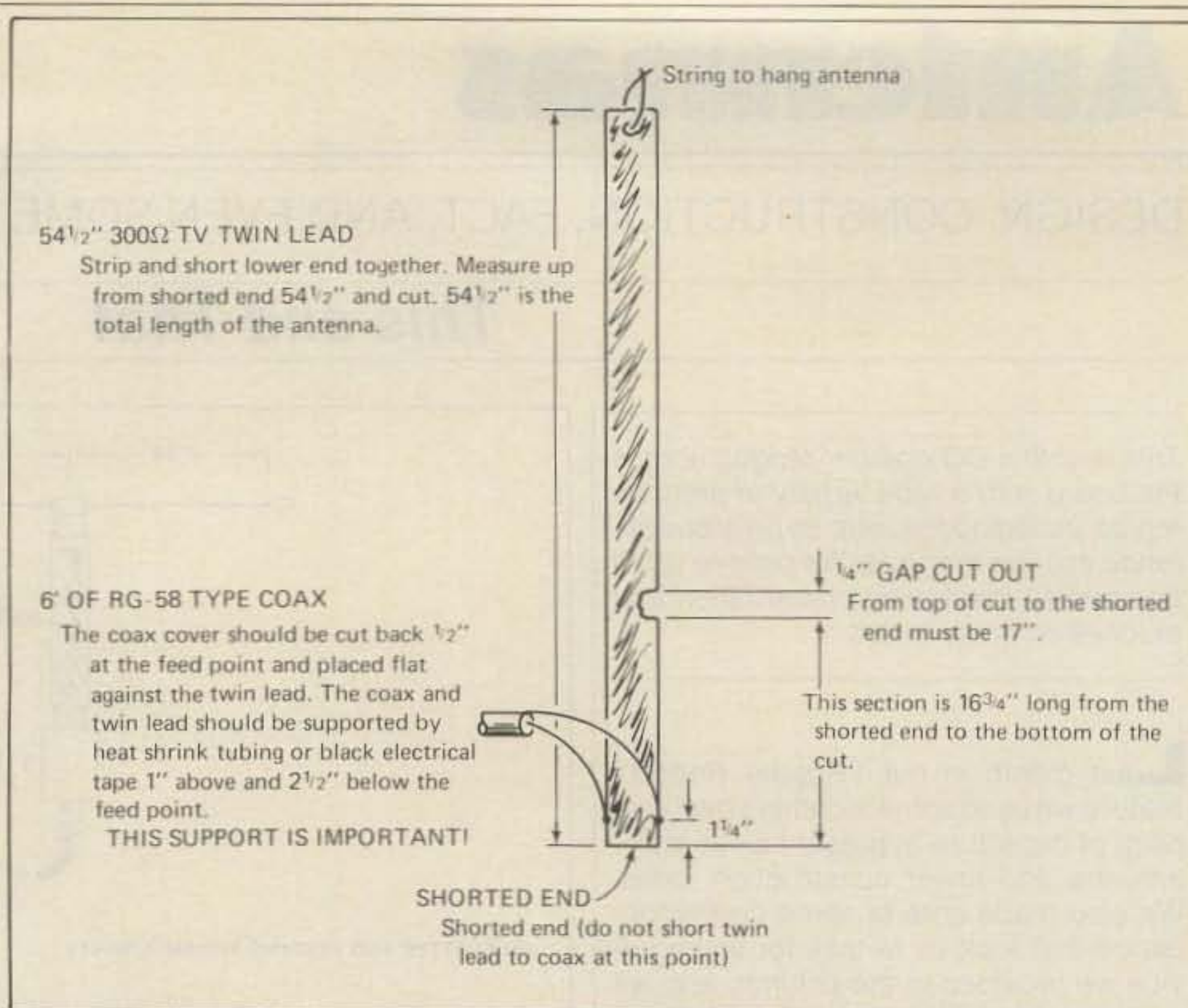


Fig. 2—Shirt-pocket J-pole 2 meter antenna. (Source: *Top of the Rock*, June 1983.)

portable antenna should give better performance than a short quarter-wave-length, back-of-the-rig whip or similar antenna for casual portable operation—as in a motel while on the road. This design is by Dwaine, K15A, and I saw it in the June 1983 issue of *Top of the Rock*, the journal of the Alford Memorial Radio Club, as submitted to the *Rock* by Dave, KA4HMG.

A little background on the J-pole is in order here. It's an antenna that has been in and out of popularity since the 1930s as a very simple, inexpensive, and easily constructed resonant antenna for v.h.f. and u.h.f. use. In its "first-class" incarnation, such as for business, police, and fire applications, it is normally constructed from parallel lengths of aluminum tubing supported at the bottom where the matching stub is located. A distinct advantage of this antenna is that despite its relatively great length, a "Slim-Jim" appearance results, as no radials are required for proper operation.

In most quick-and-dirty ham versions, designed for windowsill, attic, and other tucked out-of-the-way situations, the antenna is simply constructed out of a length of TV-type 300 ohm twinlead and tacked, stapled, or tied at the top to a beam or other support. It can be fed in one of several ways, but the most convenient feed is by 50–75 ohm coax through the built-in quarter-wave matching section, which is made from the lower portion of the twinlead itself. (Note the way the coax is attached to the mounting section; in practice, the feeder attachment point may have to be varied slightly for best operation and lowest s.w.r.)

The dimensions shown in fig. 2 should work well for 2 meter operation, and they may be proportionalized for operation on other v.h.f. and u.h.f. bands. To keep antenna operation from being upset, try to keep it as far away as possible from interior wiring and large metal objects. Feeder length should not be critical.

One advantage of the J-pole, of course, is that the antenna and its feedline form an integral unit, which is flexible and can easily be stuffed into a suitcase or pocket. The whole thing can also be rolled up and packed along with the transceiver in its carrying case or box, or carried in the glove compartment of an automobile. Expect performance to be much better than that of a quarter-wave antenna, but slightly inferior to that of a $\frac{5}{8}$ -wavelength ground plane.

More From WD4BUM

Several months ago, while perusing the "good deals" in the Atlanta Ham Festival fleamarket, George Shira, WD4BUM, flaged me down. George has a small business in Anderson, South Carolina, where he manufactures a variety of h.f. and v.h.f./u.h.f. mobile antennas, mounts, and accessories. I had mentioned his products in a previous column (*CQ*, April 1982), and he wanted to show me a new three-band magnetic-mount mobile antenna he was putting on the market.

The antenna is designed for operation on the 144, 220, and 445 MHz bands. It consists of two interchangeable stainless steel rods (one for quarter-wavelength operation on 220 MHz, the other for either quarter-wave operation on 144 MHz or

three-quarter-wave operation on 445 MHz) and a standard mobile mount, plus a length of coax. With this arrangement it is possible to change operation from 2 to $\frac{3}{4}$ meters without leaving the vehicle. A quick change of rods is required for a switch to 220 MHz operation. No traps or gimmicks are involved, which at these frequencies can lead to losses and high s.w.r. problems.

According to George, the antenna operates over the bulk of the three bands with an s.w.r. of less than 1.5 to 1. The antenna is priced at \$14.95 with a choice of PL-259 or BNC connector; the latter connector is recommended for 445 MHz operation.

An inexpensive product that George sells in considerable quantities and that he provides as a "freebie" with any magnetic antenna or mount is a little 4 inch diameter vinyl cutout which can be placed under the mag mount in order to protect the automobile paint job from marring. The adhesive-backed vinyl sticks easily to metal surfaces, and it also may be razor-trimmed and affixed to the bottom of the mount instead, should one be concerned with the possibility of the adhesive baking onto the paint surface. The vinyl protectors should not significantly affect antenna performance, as adequate coupling should exist between the mount and the metal car surface. The protectors are available from WD4BUM for 25 cents. His address is: RFD 7, Box 1011, Anderson, SC 29624.

HamPUG: Ham PET Users Group

With the increasing use of personal computers (PCs) in the ham shack, it was inevitable that specialized computer users would form their own "users groups" to swap technical and product information, as well as special-purpose software. One such group is the HAMPUG, or Ham PET Users Group, which is made up of hams who use the PET and other Commodore computers.

A "coordinator" for the HAMPUG, which is casually organized, is Clark L. Stewart, W8TN, 104 Henrietta St., Ravenswood, WV 26164. In a recent note he advised that there is no particular person handling the exchange of programs for the group. However, interested Commodore computer users may wish to check into the 40 meter net on 7.156 MHz at about 1300 UTC on Saturdays, or into the 20 meter net on 14.240 MHz on Sundays at 1700 UTC. Clark also advises that Don, WD0CHW, is quite active with ham radio programming for the Commodore 64, while Bob, WA2YNT, is similarly active with the Vic-20.

In addition to the HAMPUG, we understand that an Ontario-based Vic-20 ham net is active on Monday evenings on 3760 kHz. Net manager is Joe Cain, VE3ANJ, and net control is Bill Melhuish, VE3AOY. Be flexible on the time; I have it as 8:30 p.m. EDT as this is written.

We'd like to hear of other users groups having a distinct ham radio flavor, not only for the Commodore/PET series, but for other popular PCs.

CQ Back Issues and Articles

We often receive requests for back issues of CQ which contain referenced antennas column articles, as well as copies of individual columns alone. We normally keep only a couple of personal copies of the magazine for our files, and thus are unable to furnish whole issues. Often, a reader will request copies of an entire series of Antennas column articles, such as the seven-month-long "Antenna Accessories for the Hamshack" series. While we can usually help out with a xerox copy of a column here and there, we ask that you try first to obtain the article locally from another amateur, or from a local library, as many of the latter receive CQ. Next best is to order the particular issue in which the article is found from the CQ offices. Back issues or copies of articles are usually available directly from CQ at \$2 each—a good deal. These issues can be obtained by writing to CQ at 76 North Broadway, Hicksville, NY 11801 and enclosing a check or money order with the request.

If you need a particular antennas column or article for your files or a project and for some reason you can't obtain it otherwise, I can furnish you with a copy. Figuring copying costs at about 25 cents

per page and an average of 4 pages per monthly column, then adding in a fudge factor for postage, about \$1.25 per article or column should do it. IRCs would be appreciated from overseas readers.

Wrap-up

We hope you've enjoyed this month's potpourri of antenna topics. These have included more details on the WB3GXV tower, some ideas on construction of Windom and J-Pole antennas, and mention of the HAMPUG nets, plus assorted odds and ends. Next month we'll present several additional antenna topics of current interest.

73, Karl, W8FX

Bibliography

Grove, Robert B., WA4PYQ. "The Grove All-Band Dipole," *Monitoring Times*, May-June 1983.

Staff article, "Multiband Antennas—How Not to be Trapped," 73, March 1975.

Stanley, J.A. *Ham Antenna Construction Projects*, Howard W. Sams & Co., Inc., Indianapolis, 1969.

Thurber, Karl T., Jr., W8FX. Antennas column (untitled), CQ, November 1981. (Description of the "J" as a monitoring antenna for v.h.f./u.h.f.)

Thurber, Karl T., Jr., W8FX. "The Windom and its Close Cousins," in the Antennas column, CQ, January 1981.

Top of the Rock, bulletin of the Alford Memorial Radio Club, Stone Mountain, Georgia, Vol. 1, No. 6, June 1983.

Addenda

Add these to the list of the amateur software sources which we published in the October 1983 antennas column, page 105. Again, our apologies to any ham software source we did not include, either in this listing or in the original October 1983 "amateur software sources" listing.

VIC/CBM-64/TRS-80

Base 2 Systems
2534 Nebraska St.
Saginaw, MI 48601

VIC

Journal/20
P.O. Box 1149
Van Alstyne, TX 75095

VIC/PET/CBM-64

Amateur Accessories
6 Harvest Ct., RD7
Flemington, NJ 08822

Apple/VIC

HRA Electronics
P.O. Box 571
Hoodspoint, WA 98548

Apple

Bob Jackson
Box 57304
Webster, TX 77598

TRS-80

Edward W. Sleight, K4SB
3496 Velma Dr., S.W.
Powder Springs, GA 30073

IBM-PC

Micro Electronic Systems
19 Annette Park Dr.
Bozeman, MT 59715

VIC/CBM-64/PET/Apple/IBM-PC

Flynn's Business Services
P.O. Box 903
Mountain View, CA 94043

Various Computers

AMSAT Software Exchange
Box 27
Washington, DC 20044

Various Computers

EGE, Inc.
13646 Jefferson Davis Hwy.
Woodbridge, VA 22191

Various Computers

Long's Electronics
2700 Crestwood Blvd.
Birmingham, AL 35210

VIC/CBM-64/PET

Procast
P.O. Box 682
Millersville, MD 21108

VIC/CBM-64

G. Delano
2400 Hubert
Bakersfield, CA 93308

VIC/CBM-64

Electronic Put-Ons
7805 N. E. 147th Ave.
Vancouver, WA 98662

TI99/4A

John A. Pierce, WA3RSK
5720 East Pine Drive
Riverdale, MD 20737

CBM-64

Dennis Oliver, N7BCU
20909 S. Ferguson Rd.
Oregon City, OR 97045

VIC/CBM-64

USEFUL Software
P.O. Box 115
Lake Elmo, MN 55042

Various Computers

Mark Electronics
17589 Birch
Romulus, MI 48174

Printer Configuration Programs

Down and Out Software
33 Storm Drive
Holtsville, NY 11742

TRS-80

CYNWYN
4791 Broadway, Suite 2F
New York, NY 10034

VIC/CBM-64

FoxTango Corporation
Box 15944C
W. Palm Beach, FL 33416

Contest Calendar

a monthly feature by
FRANK ANZALONE, W1WY

NEWS/VIEWS OF ON-THE-AIR COMPETITION

The addendum to the 1982 CQ WW Contest results in the November issue listed a number of additions and corrections. However, it did not show three important corrections in the C.W. Trophy awards.

1. In the C.W. results October issue N2AA was shown as the U.S.A. Plaque winner in the Multi-Multi category. However, N2AA had won the plaque the previous year and therefore was not eligible for the 1982 award. The N6RJ Plaque goes to K1OX, the runner-up.

2. In the Single-Band division, EA8AK was listed as the winner of the World 1.8 MHz award. However, again the three-year eligibility clause makes EA8AK ineligible. The K7JA Memorial Plaque goes to EA9EU.

3. The DX Family's 21 MHz award for Japan was left out completely. JE1AYU should have been listed as the winner.

The Hungarian DX Contest I have listed for January 21-22 is an exact duplicate of the one run last month. I have two copies showing different dates, so I am a bit confused. If you didn't hear any HA activity last month on December 10-11, you might check the January dates.

I am sorry to report W4GSM as a Silent Key. Terry was an avid DXer and Contest-er, having operated several contest expedition stations in both our WW and WPX contests. He still holds the 28 MHz North American record for the WPX S.S.B. contest from his 1980 operation as FG0DYM/FS7. He will be missed in the pile-ups.

This month's column is much longer than usual, so I will dispense with any additional comments about our WW 160 Meter C.W. Contest coming up at the end of this month. Complete rules appear on page 56 and they need no additional explanation. They are exactly the same as those used last year with the new QSO point scoring and elimination of the QSO serial number in the exchange. Hope we hit another good weekend. Good luck!

Deadline for the April issue is January 15th, and February 15th for the May issue. Send all material to my home QTH.

73 for this time, Frank, W1WY

"73" 40 & 75 S.S.B. Contest

40 M.: 0000Z to 2400Z Sat. Jan. 7
75 M.: 0000Z to 2400Z Sun., Jan. 8

This is the third time around for both these contests sponsored by 73 Magazine. Each band is treated as a separate contest and requires separate entries.

There are two classes: single operator

14 Sherwood Road, Stamford, CT 06905

Calendar of Events

* Jan. 1-	Dec. 31	U.B.A. SWL Competition
* Jan. 2-10		New Zealand Scout Jamboree
Jan. 7-8		"73" 40&75 M. S.S.B. Contest
Jan. 14-15		"73" 160 M. S.S.B. Contest
Jan. 14-15		White Rose SWL LF Contest
Jan. 14-15		"Hunting Lions" QSO Party
Jan. 20-22		"A5" WAS SSTV Contest
Jan. 21-22		AGCW-DL QRP C.W. Contest
Jan. 21-22		Mich. QRP Club C.W. Contest
* Jan. 21-22		Hungarian DX Contest
Jan. 21-22		North Dakota QSO Party
Jan. 21-22		Texas QSO Party
Jan. 27-29		CQ WW DX 160M C.W. Contest
Jan. 28-29		French C.W. Contest
Jan. 28-29		U.B.A. 1984 Trophy Contest
Jan. 28-29		Michigan YL QSO Party
Jan. 29-30		Classic Radio Exchange
Feb. 4-5		RSGB 7 MHz Phone Contest
Feb. 4-5		Vermont QSO Party
Feb. 4-5		ZERO District QSO Party
Feb. 4-5		Arizona QSO Party
Feb. 11-12		Dutch PACC Contest
Feb. 11-12		QCWA C.W. QSO Party
Feb. 11-12		YL-OM Phone Contest
Feb. 18-19		ARRL DX C.W. Contest
Feb. 18-19		YL ISSB Phone QSO Party
Feb. 18-26		Roman Castles Contest
Feb. 24-26		CQ WW DX 160M S.S.B. Contest
Feb. 25-26		French Phone Contest
Feb. 25-26		RSGB 7 MHz C.W. Contest
Feb. 25-26		YL-OM C.W. Contest
Mar. 3-4		ARRL DX Phone Contest
Mar. 10-11		QCWA Phone QSO Party
Mar. 17-18		Bermuda Contest
Mar. 17-18		YL ISSB C.W. QSO Party
Mar. 24-25		CQ WW WPX S.S.B. Contest

* Covered last month.

and multi-operator single transmitter. Single operator stations are limited to 16 hours of operation. Multi-operator stations can operate the full 24 hours. Off periods must be no less than 30 minutes each and indicated on your log and summary sheet.

Exchange: RS and QTH. State, province, or territory for U.S. and Canada; country for DX (including KH6 and KL7).

Points: Five points per contact made within the continental U.S. and Canada; 10 points for all others.

Multiplier: One for each U.S. state (48), each Canadian prov./terr. (13), and each DX country worked.

Final Score: Total QSO points times the total multiplier points.

Awards: Awards will be issued to the winners in each class, in each U.S. state, each Canadian prov./terr., and each DX country. (A minimum of 100 QSO's is required to be eligible.)

Duplicate contacts in excess of 2% of the final score and other infractions will be considered grounds for disqualification. Include a dupe and summary sheet and the usual signed declaration. Entry

and log forms are available by sending a large s.a.s.e. to the addresses below.

Mailing deadline for all entries is February 12th. Forty meters go to: Dennis Younker, NE6I, 43261 Sixth Street East, Lancaster, CA 93535. Seventy-five meters go to: Jose A. Castillo, N4BAA, 1832 Highland Drive, Amelia Island, FL 32034.

"73" 160 Meter S.S.B. Contest

0000Z Sat. to 2400Z Sun., Jan. 14-15

This is the fifth annual 160 Meter S.S.B. Contest sponsored by 73 Magazine. There are two classes: single operator and multi-operator single transmitter. Single operator stations are limited to 32 hours of operating time; multi-operators may operate the full 48-hour contest period.

Exchange: RS and QTH. State for the U.S., province/territory for Canada, and country for DX stations.

Points: Five points for contacts between W/VE stations; 10 points for all other contacts.

Multiplier: One for each U.S. state (48), Canadian prov./terr. (13), and each DX country worked.

Final Score: Total QSO points times the sum of the multiplier points.

Awards: Will be issued in both classes in each U.S. state, Canadian prov./terr., and DX country. A minimum of 100 QSOs must be worked to be eligible.

U.S. and Canadian stations are expected to observe and not transmit in the DX Window, the 5 kHz segment between 1825-1830 kHz.

Disqualification may result for irregularities in logging, failing to omit duplicate contacts, and other infractions resulting in a score reduction of more than 2%.

Include a summary sheet, multiplier check list, and a QSO dupe sheet for logs with 100 or more contacts. Log forms are available by sending a large s.a.s.e. to the address below. Mailing deadline for entries is February 19th. This year they go to: Harry Arsenault, K1PLR, 603 Powell Avenue, Erie, PA 16505.

White Rose SWL LF Contest

1200Z Sat. to 1200Z Sun., Jan. 14-15

Not too many DX contests have an s.w.l. class. However, here is one sponsored by the White Rose Radio Society of England for s.w.l.'s only.

You can use up to 18 hours out of the 24-hour contest period, but be sure you indicate off times in your log. There are two separate sections, phone and c.w., with no mixed-mode entries—only the three l.f. bands (1.8, 3.5, and 7 MHz).

Points may be claimed only for stations

heard in contact with another station. Both stations may be logged, but the practice of logging a series of QSO's made by one station is not allowed. Logs must not include the same call in the "station worked" column more than 10 times on each band.

Scoring: One point for each station heard on each band from one's own continent; 5 points if station is in another continent. Multiply total points by number of different countries heard on each band. Add three band totals for final score.

The ARRL country list is the standard. Each call area of the U.S., Canada, Australia, and New Zealand will be considered a separate multiplier. Show date and time in GMT, band, station heard, station being worked, and signal report. Points may only be claimed for stations actually heard. If points are claimed for both stations, both calls must appear in the "station heard" column. Certificates of Merit will be awarded at the discretion of the Society.

Entries must be received by March 3rd and go to: White Rose A.R.S., Att: John Hart, G3ZGA, P.O. Box 73, Leeds LS1 5AR, England.

"Hunting Lions" QSO Party

1200Z Sat. to 1200Z Sun., Jan. 14-15

Sponsored by Lions International and coordinated by the Rio de Janeiro Arpoador of Brazil, the objective of this activity is to "create and foster international understanding and cooperation among Lions and amateur radio operators worldwide."

There are two categories: single operator and multi-operator (radio clubs and societies). The same station may be contacted once on each band and mode, 10-80 meters. Score each mode separately.

Scoring: One point between stations within the same continent, 3 points if between different continents. There are additional bonus points. Contacts with a member of a Lion, Lioness, or Leo Club in the same country, 5 points. If in a different country, 10 points. If with a member of the Arpoador Lions Club, 20 points.

Total QSO and bonus points is your final score.

Frequencies: Most of the activity will be found within the first 50 kHz of each band, phone or c.w., and also around 14270, 21270, and 28270.

Awards: Will be made for both phone and c.w. Trophies to the top three in each category, plaques to 4th through 10th places on c.w. Participants submitting logs with at least 5 contacts will receive a certificate. A special award will be given to the club showing the most participation by its members.

It is suggested that you write to the Rio de Janeiro Arpoador Lions Club for more detailed information. Stateside stations can write to: Lions Club International, Att.: Robert Cywinski, 300 22nd Street, Oak Brook, IL 60570.

Logs must be postmarked no later than February 5th and go to: Rio de Janeiro Arpoador Lions Club, Rua Sao Francisco Xavier no. 246, apt. 407, 22550 Rio de Janeiro, RJ, Brazil (airmail, of course).

A5 ATV WAS SSTV Contest

6 p.m. EST Fri. to 6 p.m. Sun., Jan. 20-22

This is the third annual SSTV Contest sponsored by *A5 ATV Magazine*. The objective is to contact U.S. states on video mode only. All contacts must be in video form with a minimum of callsign and RSV signal report, sent and received.

Each SSTV contact is worth 10 points regardless of location. Each new state worked is worth 100 points, and you pick up 500 points if you contact Alaska or Hawaii. Total points is your final score.

Advanced and Extras will be found on 3845, 7171, 14230, 21340, 28680; Generals on 3990, 7290, 21440, and 28680.

The top scorer gets a three-year subscription to *A5 ATV Magazine*; district leaders, a one-year subscription. All entrants will receive a special "gold" certificate. Logs go to Contest Mgr. Mike Stone, WB0QCD, *A5 ATV Magazine*, P.O. Box H, Lowden, IA 52255.

AGCW-DL QRP Contest

1500Z Sat. to 1500Z Sun., Jan. 21-22

This is the winter edition of this QRP Contest organized by the AGCW-DL. It's a c.w. only contest, all bands 10 to 160 meters. The same station may be worked on each band for QSO and multiplier credit.

There are five classes as follows:

- A. Single Opr.—3.5 watts or less.
- B. Single Opr.—10 watts or less.
- C. Multi-Opr.—10 watts or less.
- D. QRO stations, over 10 watts.
- E. S.w.l.'s

Multi-operator stations may operate the full 24 hours. All other classes must take a 9-hour break.

Exchange: RST, QSO no., and power input. Add X if transmitter is crystal controlled (550001/5X). QRO stations add QRO (579002/QRO).

Points: QSO with own country, 1 point. Other countries own continent, 2 points. DX outside own continent, 3 points. Crystal-controlled stations are limited to 3 crystals for each band, and take double above points for QSOs.

Multiplier: One for each country and one for each DX contact. For scoring purposes call areas in JA, PY, VE, VK, W/K, ZS are counted as multipliers.

Final Score: Total QSO points times the multiplier on that band. Add the sum of scores from each band.

Awards: Certificates to the first three places in each class on each band.

Use a separate log for each band. All entries must be received by the contest manager no later than 6 weeks after the end of the contest. They go to: Siegfried

Hari, DK9FN, Spessartstrasse 80, D-6453 Seligenstadt, Fed. Republic of Germany (include one IRC for results).

Michigan QRP Club C.W. Contest

1500Z Sat. to 1500Z Sun., Jan. 21-22

This is the fourth annual contest sponsored by the Michigan QRP Club. It's a c.w.-only affair on all six bands, 160-10 meters.

Each station will compete within own U.S. state, VE province or DX country in one of three categories:

- 1. 1 watt or less output.
- 2. 5 watts or less output.
- 3. over 5 watts output.

Exchange: RST, state, province, or country, and power output.

Scoring: Each contact is worth 1 QSO point. Multiply total QSO points from all bands by number of states, provinces, and DX countries worked per band for final score.

There is also a bonus multiplier of 1.5 times the final score if emergency power supply is used (generator or battery supply).

Frequencies: 1810, 3560, 7040, 14060, 21060, 28060. Novice—3710, 7110, 21110, 28110.

Awards: Certificates to the highest scorers in each category, in each state, province, and country.

Use a separate log sheet for each band, a summary sheet showing the scoring, equipment used, and power output, and your name and address in block letters.

Entries must be received no later than 6 weeks after the end of the contest. Include a large s.a.s.e. (or 2 IRC's) if results are desired. They go to: Michigan QRP Club, Contest Manager, 281 Crescent Drive, Portland, MI 48875.

North Dakota QSO Party

0000-0800 & 1600-2400 Sat., Jan. 21
0800-1600 UTC Sun., Jan. 22

This is the third time around for this party sponsored by the Red River Amateurs. The same station may be worked on each band and each mode for QSO points.

Exchange: RS(T) and QTH. County for ND stations; state, province, or country for others.

Scoring: Phone contacts count 10 points, c.w. 20 points, and RTTY 50 points. ND stations can add 100 points for working 5 Novice stations.

Final Score: ND stations multiply total QSO points by number of states, provinces, and countries worked; others use ND counties for their multiplier (maximum 53).

Frequencies: Phone—1835, 3905, 7280, 14295, 21380, 28580. C.W.—1810, 3540, 7035, 14035, 21035, 28035. Novice—3725, 7125, 21125, 28125.

Awards: Certificates to state, province, and country winners. Plaques to top ND

scorer and top out-of-state winner.

Mailing deadline for logs is February 28 to: Mike Beaton, KD0A, 2267 Flickertail Dr., Fargo, ND 58103. (Include a large s.a.s.e. for a copy of the results.)

Texas QSO Party

0000Z Sat. to 1800Z Sun., Jan. 21-22

This one is again organized by the West Texas ARC. The same station can be worked on each band and each mode, and mobiles in each county change. Single operator only.

Exchange: QSO no., and QTH. County for Texas stations. State, province, or country for others.

Scoring: Texas stations score 1 point per QSO on phone, 2 points if on c.w., fixed or mobile. (In-state contacts permitted for QSO and multiplier credit.) Non-Texans same as above. However, Texan phone mobiles are worth 5 points, c.w. mobiles 7 points.

Multiplier: Texans use states, VE provinces, DX countries, and Texas counties. Non-Texans use Texas counties (maximum of 254).

Frequencies: C.W.—3565, 7065, 14065, 21065, 28065. Phone—3940, 7260, 14280, 21370, 28600. Novice—3710, 7110, 21110, 28110.

Awards: Certificates to the top scorers in each state, VE province, and DX country, and top 10 Texas stations. There are also plaques for the overall winners in seven different areas: U.S., U.S. Novice, DX, VE, Texas fixed, mobile, and Novice stations.

All logs must be received by March 15th. This year they go to: Tom Horton, K5IID, 2708 Halifax Avenue, Odessa, TX 79762.

French DX Contest

0600Z Saturday to 1800Z Sunday
C.W.: Jan. 28-29 S.S.B.: Feb. 25-26

The announcement from the REF this year was rather brief, but using the format from previous years, I have come up with the following.

It's the world working the French Europeans as well as other French-speaking countries, departments, and territories all over the world. They mostly can be identified by the letter "F" in the prefix of their calls.

The following countries may also be worked for QSO and multiplier credit on each of the five h.f. bands: HB, HH, LX, OD, ON (11 provinces), VE2, 3B, 4U, 9Q, 9U, 9X.

There are two classes, single and multi-operator. Single operator stations are limited to 26 hours of operation. The 10 off hours may be taken in 3 periods.

Exchange: RS(T) plus a 3 figure QSO number starting with 001. French and Belgian stations will include two figures or letters to identify their department or province.

Points: Three points per contact.

Multiplier: One point for each department and country or territory as follows: 95 French European departments, 5 overseas departments, and 9 territories, and countries of the DUF awards. Also the countries listed above, including the 11 ON provinces. (A rather confusing assortment—ed.)

Final Score: Sum of QSO points multiplied by the sum of multiplier points from each of the five h.f. bands.

Awards: Certificates to the top scorers in each class in each country (minimum of 100 QSO's).

The usual disqualification rules will be in effect. Official log and summary sheets are available from the REF headquarters. Include an IRC and s.a.e. with your request. This year logs to to Contest Manager F6ENV, REF, square Trudaine 2-75009 Paris, France.

UBA 1984 Trophy Contest

C.W.: Jan. 28-29 S.S.B.: Feb. 25-26
0600Z Saturday to 1800Z Sunday

The Union of Belgian Amateurs is running this one in conjunction with the French Contest on the same weekend. Contact with one French station counts one QSO point and one multiplier. Use all 5 bands, 10-80 meters to work Belgian and French stations.

Classes: A. Single Opr., 40&80 M. 16 hrs.
B. Single Opr., All Bands. 26 hours.
C. Multi-Opr. Single Xmtr. 36 hours.
D. SWL in both A & B class.

Exchange: RS(T) plus a QSO number. Belgian stations will include two letters to identify their province.

Points: Contacts with ON stations and Belgian Forces in Germany, 10 points. QSO with French station, 1 point. (See REF contest rules.)

Multiplier: Each Belgian province (9) plus 1 Belgian Forces or French country, for a maximum of 10 per band.

Final Score: Total QSO points times the sum of the multipliers from each band.

Awards: Certificates to the winners in each class in each country.

Use a separate log sheet for each band, and include a summary sheet showing the scoring and the usual signed declaration.

Contacts made during this contest may be used for the "Worked All Belgian Provinces" award. Include a list of the 9 provinces worked and 10 IRCs or \$3.00 with your entry.

Deadline for mailing c.w. entries is March 1st, and April 1st for s.s.b. They go to: UBA HF Contest Committee, Galicia Jan ON6JG, Oude Gendarmeriestraat, 62 8-3100 Heist op den Berg, Belgium.

Michigan YL QSO Party

1800Z Sat. to 1800Z Sun., Jan. 28-29

This is a new one sponsored by The Auto State Young Ladies. Rules are a bit vague, but here they are for what they are worth.

Exchange: Call, signal report, QTH, and TASYL number for members.

Scoring: Points for contacts— $\times 2$ for c.w., $\times 2$ for working a TASYL member (exactly as it was worded—ed.). Multiply total QSO points by number of different ARRL sections and DX countries worked.

Activity will be on phone and c.w. No net or repeater contacts. Work same station once only.

Certificates will be sent to all participants submitting a log. Party logs must be received before February 25th and go to TASYL President, Carol Hall, WD8DQG, 4651 Cardinal Dr., Mt. Pleasant, MI 48858. The attractive TASYL certificate may also be earned from contacts with members during the Party.

A minimum of 15 points is required by Michigan stations; all others only 10 points. Contacts with charter members 1-50 count 2 points; all other members 1 point.

Submit a signed log certified by two licensed amateurs (General or higher) or an official of a recognized club to: Mary McCarthy, WA8WZF, 2823 W. First Street, Ludington, MI 49431. (Include a \$1.00 to cover cost and mailing.)

Classic Radio Exchange

2100Z Sun. to 0400Z Mon., Jan. 29-30

This is the winter edition of this unusual event. The format is the same as it has been for the past several years. The object is to restore and operate older equipment with other like-minded hams, not required in the exchange, but a distinct advantage in the scoring. A classic radio is any equipment built since 1945 but at least 10 years old (25 years would be more in line—ed.).

The same station may be worked on each band and each mode, and with different equipment combinations.

Exchange: Name, RS(T), QTH, receiver and transmitter type, and other interesting conversation.

Scoring: Multiply total QSOs from all bands and all equipment combinations used by the number of different receivers, transmitters, states, provinces, and DX countries worked on each band and each mode. Multiply that total by your classic multiplier: total years old of all receivers and transmitters used. Three QSOs minimum per unit. Multiply age by two if gear is a transceiver.

Frequencies: C.W.—60 kHz up from low edge of each band. Phone—3910, 7280, 14280, 21380, 28580. Novice—3720, 7120, 21120, 28120.

Send logs, comments, anecdotes, etc., to: Stu Stephens, K8SJ, 1407 Hollywood Road, Sandusky, OH 44870. Include an s.a.s.e. for a copy of the newsletter with the results. (Now if Stu would cut down the scoring requirements and include some kind of an award, he might lure some fellows from other activities—ed.)

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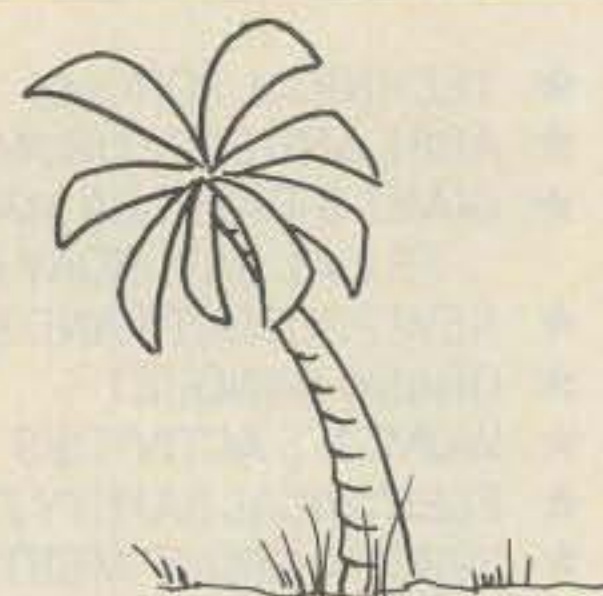
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24th
ANNUAL

TROPICAL HAMBOREE

FEBRUARY 4 - 5, 1984

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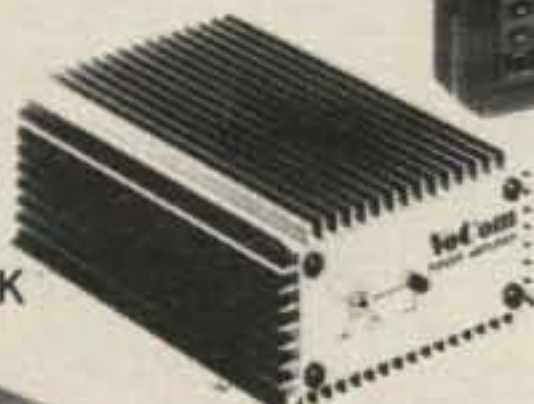
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NEWS OF CERTIFICATE AND AWARD COLLECTING

The story of the month for January as told by John is:

John A. Devoldere, ON4UN All Counties #417 2-17-83

"It was on December 2nd that I stumbled across the County Hunters Net on 14.336 for the very first time. N4HY/M in Alabama was my very first QSO on the net, although I never copied his county! Immediately Bill, WA3ZMY, took me off frequency and explained to me all I needed to know and how I could get information from W0DG. The next day I worked my first (known) county on the net with K4RQX/M in Olathe, Kansas. I was hooked! The third day I met Gene, N4ANV, and he explained how difficult it would be for a DX station to handle the MRC's without a QSL manager (wonder if he ever regretted it?).

"The first few weeks I worked a lot of 10 meter, looking for new counties with fixed stations. In the evening, after 10 meters went dead, I would come on 14.336 and add some more to the list. At the same time, I obtained the US Zip code and post office directory, which allowed me to find out the counties of some 5,000 to 10,000 W-QSL's I had, not mentioning their counties (why don't they all mention it?). It took me weeks to check through all the cards. The net result was very poor—only just over 500 confirmed counties.

"By the end of January 1980 (and almost 4,000 QSO's later) I had over 1,700 counties worked. On August 1st of the same year the number had increased to some 2,540, and exactly one year after I started, the score was 2,840 worked with 2,250 confirmed (Gene was really working hard!). Early in 1981 the 3,000 cliff was passed, and Jim, WB5YDH, gave me my (first) last county with La Salle, Louisiana, on October 23rd, less than two years after I started. Later, Fred, W5FS, gave me Cibola, New Mexico, for my 'second' last one, while Ken and Avon, W7LQT and WB7WBZ, did it all once more with La Paz, Arizona, on Jan. 2nd, 1983.

"In the summer of 1983 I had the pleasure of meeting Gene, N4ANV, and Pat in their home in North Carolina, as well as Bill, WA3ZMY, and Al, W0EWH, for a short eyeball at Washington, D.C. National airport. In November of the same year, I spent more time with Bill, and together with Andy, W3XE, I was introduced to the ever-so-famous ZMY crab legs. On that

same trip I picked up some solid state RTTY equipment, and after that I spent almost all my time on the air, for almost a year, on RTTY. In June 1982, though, after having had another go at the ZMY crab legs, Bill convinced me that I should try to get the last needed confirmations, and that started me on the inevitable reworks. It was a great thrill to be at the Manchester mini-convention in November 1982. It was really a thrill for me to be able to put faces to all those familiar calls and names! Meeting those who had helped me to work them all was very exciting, and being able to present Jim, WB5YDH, with a reall 'ball of wax' (credit to Gene) was no less thrilling!

"With the special help of Pete, K4QFK, I was able to work the last couple of reworks (tnx WB5YDH, WB3DWH, KD0U, WA0YFQ, N4FOZ, N9CLZ, and all others), and Pete himself made a special trip to Hertford, North Carolina, for my last rework (Jan. 25th). Today, just over 3 years after it all started, I made it—USA-CA #417. But more important to me is that I made a lot of friends, met fine hams, and witnessed that finest example of a real efficient operation: County Hunting!"

(Note: John also has many other credentials. Two of the most notable ones: John holds 5-Band WAZ #1, and he has written a book 80 meter DXing. Sorry he was too modest to send his picture for the column!)



Atira Tani, JA1BN, at his station in Tokyo.

Special Honor Roll All Counties

- #433 John Harvey, KK0L 9-6-83.
- #434 Emil Bitterlich, WA1VXW 9-10-83.
- #435 Don Hagler, K5CKQ 9-14-83.
- #436 Sam Shontz, KX2W 9-19-83.
- #437 Bill Hatcher, N5BDY 9-26-83.



June, WB1ENJ, Art, WB0GRN, and Art's wife, Glenn, enjoying the riverboat cruise during the Charleston convention. (Photo by WB0TVL.)

Awards Issued

John Harvey, KK0L, waited until he finished them all and then sent for All Counties #433, all S.S.B.

Emil Bitterlich, WA1VXW, had me send him USA-CA-3000 #466 and All Counties #434, all 20M Mobile, S.S.B.

Don Hagler, K5CKQ, also waited until he finished them all before sending for All Counties #435, all Mobile, S.S.B.

Sam Shontz, KX2W, finished all the paperwork at once and qualified for All Counties #436, all 20M Mobile, S.S.B. Many of us remember Sam as N2CLV.

Bill Hatcher, N5BDY, added USA-CA 2000 through All Counties #437, all 20M Mobile S.S.B. to his collection.

"Lefty" Clement, K1TOL, qualified for USA-CA-1000 #796, all 50 MHz, S.S.B.

Dave Bostedor, K8WKZ, received USA-CA-1000 #798, all 50 MHz, S.S.B.

Jim Brownlee, KA5IAT, added USA-CA-1000 #800, endorsed Mixed, to his certificate.

USA-CA Honor Roll

3000	K5CKQ	578	KX2W	799
KK0L	KX2W	579	KA5IAT	800
WA1VXW	N5BDY	580		
K5CKQ			500	
KX2W			KK0L	1870
N5BDY			WA5IPS	1871
	1500		KA2NDX	1872
	KK0L	646	KA2POW	1873
	K5CKQ	647	I0YKN	1874
	KX2W	648	CE5CNT	1875
2500			K5CKQ	1876
KK0L			KX2W	1877
K5CKQ			W6YLJ	1878
KX2W			JT1AN	1879
N5BDY				
	1000			
	KK0L	795		
	K1TOL	796		
	K5CKQ	797		
	K8WKZ	798		
2000				
KK0L		577		

333 South Lincoln Ave., Mundelein, IL 60060

USA-CA 500 certificates went to:
John Harvey, KK0L, #1870, All S.S.B.
Ole Jorgensen, WA5IPS, #1871, All
Fixed.

Wayne Jones, KA2NDX, #1872, Mixed.
Joe Carpenter, KA2PQW, #1873, Mix-
ed.

Nuccio Meoli, I0YKN, #1874, Mixed.

Roberto Ibreta, CE5CNT, #1875, Mix-
ed band & mode. Roberto is the first in
Chile to receive the USA-CA Award. Con-
gratulations, Roberto!

Don Hagler, K5CKQ, #1876, All S.S.B.
Mobile.

Sam Shontz, KX2W, #1877, All 20M
Mobile S.S.B.

Chuck Imsande, W6YLJ, #1878, All
20M Mobile S.S.B.

I.V. Arsen, JT1AN, #1879, Mixed.
Arsen is the first in Mongolia to receive
the USA-CA award. Congratulations to
you, Arsen!



The S.P.A.M. Award.

Awards

**S.P.A.M. (Society for Promotion of Ampli-
tude Modulation) Award.** The official S.P.A.M.
Award is presented on behalf of the entire
S.P.A.M. membership. S.P.A.M. is a non-
profit, voluntary association of radio ama-
teurs who are actively participating in the
growth of a.m. activity by joining S.P.A.M.
Membership is free and perpetual. Mem-
berships are issued only by the following:
the President, member of the Board of Di-
rectors, and a state director. There is no
monetary obligation on the part of the
member. However, membership must be
"earned." This is quite easily accom-
plished by the prospective member
checking into an a.m. group, roundtable,
or official S.P.A.M. group operating three
times on the bands below 10 meters. This
indicates that you are truly an above-
average radio amateur with a genuine ap-
preciation for this quality communica-
tions medium. The membership require-
ment is waived in cases of DX applicants
who cannot check into a local group. A
"shortcut" is to work a Board Member on
10 meters.

Once you have met the requirements,
ask for a sked with a S.P.A.M. official. He
will then turn in your name, call, and ad-
dress to headquarters, where you will be
placed on the membership roster. Sub-
ject to current availability, new members

will, when the requirement is met, be sent
the S.P.A.M. Membership Certificate
("Award"), and all members will receive
a membership card immediately. For
more information or to apply for mem-
bership, contact F.A. Dunlap, WA5TWF,
14113 Stoneshire, Houston, TX 77060,
U.S.A.

The "Osijek" Award. Radio clubs of the
city of Osijek, Yugoslavia, have estab-
lished the Osijek Award, marking the 35th
anniversary of amateur radio in the town.

QSO's may be counted regardless of
the type of emission (c.w., s.s.b., f.m.)
from January 1, 1980, and separately for
s.h.f. and v.h.f.

EU Stations

S.H.F.: radio connections with 8 differ-
ent stations in the Osijek area.

V.H.F.: radio connections with 5 differ-
ent stations in the Osijek area.

DX Stations

S.H.F.: radio connections with 5 differ-
ent stations in the Osijek area.

S.W.L. Stations

Same rules as for EU and DX stations.

Besides connections with radio sta-
tions from the city of Osijek, radio con-
nections with stations from the following
small places are taken into considera-
tion: Cepin, Dalj, Laslovo, and Josipovac,
which are near the city of Osijek.

GCR list and 5 IRC's or \$2.00 U.S. for
postal expenses have to be sent to the
manager: Kruno Ferić, YU2OM, Vj. B.
Kidrica 102/12, 54000 Osijek, Yugo-
slavia.

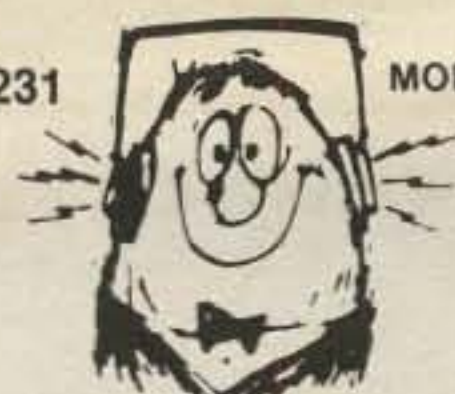


Diploma Osijek.

**The Worked High-Speed Club (WHSC)
Award.** The WHSC is a "strictly c.w. only"
award, and it is aimed at increasing activ-
ity on all bands with emphasis on enhanc-
ing activity on the 80 and 40 meters
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Basic Award: Confirmed 2-way c.w.
contacts with 100 HSC members located
in 10 countries on at least 3 different
bands. Holders of the basic award may
obtain the following stickers: 3.5 MHz—
confirmed 2-way contacts with 200 HSC
members located in 10 countries, all on
3.5 MHz only; 7 MHz—confirmed 2-way
contacts with 250 HSC members located
in 10 countries, all on 7 MHz only; 3.5 and
7 MHz—confirmed 2-way c.w. contacts
with 500 members located in 15 coun-
tries, on 3.5 and 7 MHz only; All

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RS35A 25-35 Amp	135.00
RS35M 25-35 Amp w/meter	149.00
RS50A 37-50 Amp	199.00
RS50M 37-50 Amp w/meter	225.00
AZDEN	
PCS4000 2M mobile rig	\$280.00
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BY-1 Paddle/BY-2 Chrome	\$39.00/49.00
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CN-520 1.8-60 MHz SWR/Pwr Mtr	\$63.00
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"HOW TO" FOR THE NEWCOMER TO AMATEUR RADIO

Novice Roundup

The American Radio Relay League (ARRL) sponsors the Novice Roundup (NR) Contest each February. The Novice class of license came into existence in 1951, and the first Novice Roundup was held in 1952. This year's NR is the 33rd.

The name "Novice Roundup" began many years before Technician licensees were granted code operating privileges in the so-called Novice bands. The name remains appropriate because operation remains confined to the frequency segments (bands) available to Novice class licensees on a shared basis with all other classes of American amateur radio licensees.

Participants

This contest is primarily for American Novice and Technician class licensees, but General, Advanced, Extra, and foreign (DX) operators are also invited to operate in it. Novices and Technicians can work all amateurs (Novice, Technician, General, Advanced, Extra, and DX), but General, Advanced, Extra, and DX amateurs are only allowed to work Novices and Technicians in the contest. This is a good rule, because it guarantees that at least one Novice or Technician is involved in each NR contact.

Benefits

I advise you to operate in the NR even if you have a poor station and/or low code proficiency. It will be nice if you get a certificate (see picture of ARRL Novice Roundup Certificate of Merit) for working at least 200 NR contacts, and you will have just cause to be extremely proud if you are the top scorer in your ARRL section, or one of the top ten scorers in the country.

You do not need to achieve these lofty accomplishments, however, to benefit from NR activity. This contest provides a great opportunity to contact amateurs in many counties. You probably can work more different contacts during one day of the NR contest than you normally work in a month. These contacts can help you qualify for hundreds of operating awards.

NR operation will let you judge your operating skills and station performance against those of other operators. NR participation can also help you increase code receiving and sending proficiency. You can benefit in many ways by operating in contests every week, as listed in the Contest Calendar of this magazine.

2814 Empire Ave., Burbank, CA 91504



George L. Horrell, KA7NGF, operates from Dolan Springs, Arizona. He was an amateur about 20 years ago, but he let his license lapse when he lost his sight and his wife passed away. He is back on the air using a Swan 240 transceiver with a mobile whip antenna. W6DDB recently enjoyed a solid contact with Shorty.



ARRL NR Certificate of Merit.

Competition and Awards

This contest provides a unique opportunity for Novices and Technicians to compete on the air against other Novices and Technicians in their own ARRL sections, plus against those who operate from other ARRL sections. Novices just compete against Novices, and Technicians only compete against Technicians; Novices and Technicians do not compete against each other in this contest.

The ARRL issues a nice certificate to each Novice and Technician who makes at least 200 NR contacts, and an ARRL

certificate is awarded to the top-scoring Novice and Technician in each ARRL section. The ARRL also issues appropriate certificates to the top scorers (Novices/Technicians) in the country.

General, Advanced, Extra, and foreign (DX) amateurs are invited to take part in the NR contest, but they are not eligible for NR certificates. These operators provide contacts, cards, and code practice for Novices and Technicians.

Multi-operator stations (two or more operators using the same call sign at one location, including loggers) are also ineligible to win NR contest awards. This rule keeps it a one-on-one contest and prevents a group (such as a club) from competing directly against an individual Novice or Technician operator.



This is Gary Bleasdale, KB4EB, of Charleston, South Carolina. His interest in amateur radio began when he became the MARS (Military Affiliate Radio System) operator aboard the U.S. Navy destroyer USS Nicholson. Gary is a Chief Petty Officer with 14 years service in the U.S. Navy. He has been licensed since April of 1983, and he usually operates on 15 meters. His station includes a Drake TR-3 transceiver and a ground-mounted vertical antenna. He has worked more than a dozen countries, plus all but a few states.



ARRL NR Award issued for 200 contacts.

No certificates are awarded to DX Novices who operate in the NR. However, American Novices greatly appreciate opportunities to contact DX amateurs, and I hope many DX amateurs will be on the Novice bands during this contest. Very few (150) Novices and Technicians will earn a contest certificate, but the others are likely to be happy with a few DX contacts.

Dates and Times

The NR contest starts at 0001 UTC on the 28th of January, and it ends at 2359 UTC on the 5th of February. To state it more simply, it starts Friday evening January 27th (local time), and it ends Sunday evening February 5th. The NR starts one minute past 4, 5, 6, and 7 p.m. PST, MST, CST, and EST, respectively. Similarly, the NR ends one minute before 4, 5, 6, and 7 Pacific, Mountain, Central, and Eastern Standard Times, respectively.

The NR contest length is 215 hours and 58 minutes. Novices and Technicians are allowed to work a maximum of 30 hours in the NR. The NR log must show each time one goes on and off the air during the contest, and the minimum allowable time off the air is 15 minutes. Listening time on the air counts as contest operating time, and it must be shown as time on the air. I advise you to be completely honest in all contest matters; it helps you to accurately gauge your improvement in subsequent contests.

Operating

Bands. All NR contacts must be made in the 80, 40, 15, or 10 meter Novice bands. No crossband contacts are allowed,

such as listening on 10 meters and calling or answering on the 15 meter Novice band. It does not help to work the same station more than one time on a band, or on more than one band, since credit is just allowed for one contact with each different station worked. It is fairly common to have DX amateurs call American Novices using voice (usually s.s.b.) on the 10 and 15 meter Novice bands; these cross-mode (voice-code) contacts do count in the NR, as long as both sides of the contact are within the same Novice band. Keep up-to-the-minute dupe sheets (the dupe sheets are two-sided) of all stations contacted during the NR to help you avoid working the same station more than one time.

Identification. Novices add /N and Technicians add /T to their callsigns during this contest to indicate their eligibility to all amateurs participating in the NR. As examples, a Novice with a callsign such as KB6ABC uses KB6ABC/N, and a Technician with a callsign such as WA6FNM uses WA6FNM/T during the contest. Out-of-area operation is also indicated in callsigns to minimize confusion. As an example, if a Technician with an apparent California callsign, such as WA6FNM, is operating in the NR from Louisiana, he would identify as WA6FNM/5T to indicate that he is operating from the ARRL Louisiana section instead of the Los Angeles section.

General, Advanced, and Extra class licensees are not required to indicate class of license as part of the callsign used in the NR. However, many of us use /G, /A, or /E to make it very clear to other General, Advanced, Extra, and DX ama-

teurs that we are not valid NR contacts for them; we are only valid NR contacts for Novices and Technicians. This additional identification is particularly useful in cases in which callsigns such as KA6CUT and WB6PNY are used. Such callsigns might lead one to believe that these amateurs are Novice or Technician licensees, whereas they are both Extra class amateurs.

Objective. The idea is to work as many amateurs as possible in all the countries and ARRL sections you can contact. It is very helpful to maintain a check sheet to let you see at a glance which countries and ARRL sections you still need to multiply your NR score as you operate in the contest. It is simple to start with a list that shows all ARRL sections grouped by callsign areas and to cross out each section as it is worked to show that it is no longer needed as a contest multiplier. The accompanying list of ARRL sections can be reproduced to serve as an aid.

Each time a new section or county is worked, it must be indicated (in sequence) in the NR log. Simply start with number one and continue up as you earn multipliers, including countries other than Canada and the United States.

More than one section abbreviation is shown in the ARRL sections list, if more than one is known to be commonly used. Very few foreign amateurs are usually contacted during this contest, and it is common practice to simply add the callsign of the first amateur contacted in each country to the check-off list to show it is no longer needed for NR multiplier credit.

Typical Contact. As is true in all contests,

ARRL 74 Sections Check-Off List

(1) CT	CONN	Connecticut	VA	Virginia	(8) MI	MICH	Michigan
EMA	E MASS	Eastern Massachusetts	WIN	West Indies (KG4, KP4, KV4, etc.)	OH		Ohio
ME		Maine	(5) AR	ARK	WV	W VA	West Virginia
NH		New Hampshire	LA	Louisiana	(9) IL	ILL	Illinois
RI		Rhode Island	MS	MISS	IN	IND	Indiana
VT		Vermont	NM	New Mexico	WI	WIS	Wisconsin
WMA	W MASS	Western Massachusetts	N TX	N TEX	(0) CO	COLO	Colorado
(2) ENY		Eastern New York	OK	OKLA	IA		Iowa
NLI		New York City and Long Island	S TX	S TEX	KS	KANS	Kansas
NNJ		Northern New Jersey	(6) EB	E BAY	MN	MINN	Minnesota
SNJ		Southern New Jersey	LAX	LA	MO		Missouri
WNY		Western New York	ORG	Orange	NE	NEBR	Nebraska
(3) DEL	DE	Delaware	PAC	Pacific (KH6, etc.)	ND	N DAK	North Dakota
E PA	E PENN	Eastern Pennsylvania	SB	S BAR	SD	S DAK	South Dakota
MDC	MD or DC	Maryland or District of Columbia	SCV	Santa Clara Valley			
W PA	W PENN	Western Pennsylvania	SDG	San Diego			
(4) AL	ALA	Alabama	SF	San Francisco			
GA		Georgia	SJV	San Joaquin Valley			
KY		Kentucky	SV	Sacramento Valley			
NC	N CAR	North Carolina	(7) AK	ALAS			
N FL	N FLA	Northern Florida	AZ	ARIZ			
SC	S CAR	South Carolina	ID	IDA			
S FL	S FLA	Southern Florida	MT	MONT			
TN	TENN	Tennessee	NV	NEV			
			OR	ORE			
			UT	Utah			
			WA	WASH			
			WY	WYO			

Canadian Provinces

MAR	VE1/V0	Maritimes or Newfoundland
PQ	VE2	Quebec
ON	VE3	Ontario
MB	VE4	Manitoba
SK	VE5	Saskatchewan
AB	VE6	Alberta
BC	VE7	British Columbia
NWT/	VE8	Northwest Territories or Yukon
YU		

NR contacts should be as brief as possible. A typical good NR contact between KB6ABC and W6JEP in the first few days of this contest could be as follows:

CQ NR CQ NR CQ NR CQ NR CQ NR DE
KB6ABC/N
CQ NR CQ NR CQ NR DE KB6ABC/N
KB6ABC/N
CQ NR CQ NR CQ NR DE KB6ABC/N
KB6ABC/N KB6ABC/N NR K

KB6ABC KB6ABC DE W6JEP W6JEP NR K
W6JEP DE KB6ABC BT 579 LA 579 LA BK
BK R 589 LA 589 LA DE W6JEP BK
BK R 73 CQ NR CQ NR CQ NR DE KB6ABC/N
KB6ABC/N NR K

Look at the preceding typical exchange and evaluate it very carefully with regard to the comments in the rest of this paragraph. In the initial call, KB6ABC included the /N each time with his callsign to indicate contact eligibility to all other amateurs. Notice also that the number of CQ NR transmissions decreased from five to three and station identification increased from one to three during the calling sequence, and the NR contest activity was again indicated prior to the invitation to transmit (K) at the end of the third CQ NR sequence. When W6JEP answered the call, she just identified both stations twice, left off the /N, and indicated contest participation by sending NR before the invitation to transmit. Once the two-way contact has been established, there is no need to continue using /N or /T.

The KB6ABC reply to W6JEP is very brief; the callsigns are just sent one time each and only at the beginning of the reply. The RST report and ARRL section are sent twice to minimize possible requests for repeats. Neither the term RST nor the word "section" precedes the report and League section, since it is obvious what both are, and the break sign (BK) is used to eliminate unnecessary identifications. During contest activity a series of short transmissions is not likely to extend 10 minutes, and the identification shown in the sample exchange suffices. Note that the W6JEP response is short; the R advises that the KB6ABC contest data has been received. W6JEP then sends the report (RST) and her section twice, identifies with just her callsign to give KB6ABC assurance that he is copying the correct signal, and sends the break sign to invite KB6ABC to respond.

When KB6ABC answers, he sends R to indicate the contest data has been received, he may send best regards (73), and he then sends a short contest call in case another station is waiting for a contest contact. When the short call is sent, the /N is again added to indicate contest eligibility to all amateurs. This indicated brief exchange is further abbreviated after the first few days the contest has been in progress, but the sample exchange is suitable at the start of each year's NR.

After the first few days of NR activity,

shorten the call to a single 3 by 3 or 2 by 2 (CQ NR CQ NR DE KB6ABC/N KB6ABC/N NR K, as an example) and listen carefully (above and below your transmitting frequency) for answers before repeating this call. The rest of the previous explanation holds true when using this preferred shorter calling procedure.

Brevity. Do not routinely exchange normal contact information during contest contacts. In other words, do not send your name, location (QTH), rig, antenna, weather (WX), or mailing address information as parts of contest contacts. Keep each contact brief. Do not send faster than you can receive accurately; let the other fellow slow down to a speed you can copy. If the other operator sends too fast, tell her/him to send more slowly (QRS).

If you contact a state or country you need to have confirmed, simply request a QSL when you send your card. I send a card to each amateur contacted for the first time, which is not a common practice among most amateurs. However, most amateurs send a QSL in response to each card received. If all amateurs just responded to cards received, none would be exchanged. Nevertheless, if received cards initiate completion of the QSL exchange, that is okay; the person who wants the other amateur's card is simply the one who begins the exchange.

Logging

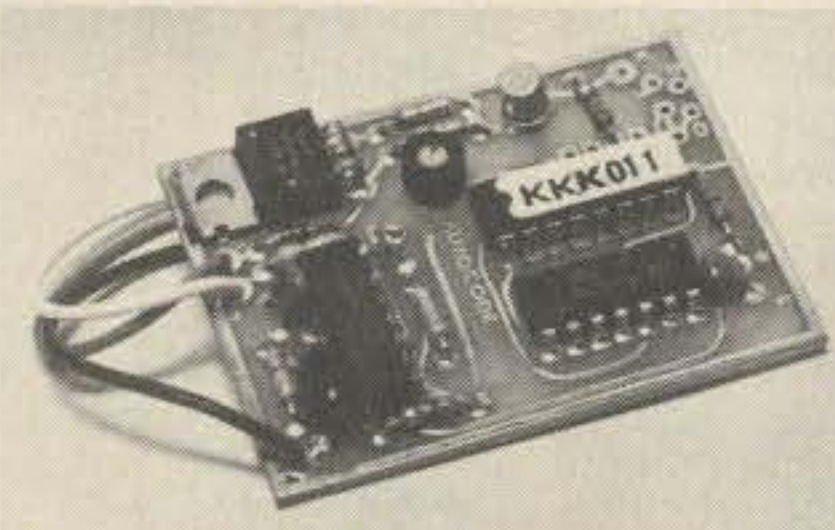
Required Entries. Your NR log must show the time each contest contact started. It is preferable to use Universal Time Coordinated (UTC) when logging radio contacts, since it eliminates possible time zone confusion. Most experienced amateurs only use UTC. UTC is still called Greenwich Mean Time (GMT), Greenwich Civil Time (GCT), Zebra time, or Zulu (Z) time by many amateurs, and they are all meant to indicate the same time. However, UTC has been the correct term for several years and it should be used. The other amateur's callsign (/N and /T indicators not required) and ARRL section (or county) must be logged for each contact. Both received and sent signal (RST) reports must appear in the NR log. Your station callsign and dates of contest operation are also required.

Forms. Special NR contest log sheets can be requested from the American Radio Relay League, 225 Main Street, Newington, Connecticut 06111.

The NR logs do not have to be mailed to the ARRL until one month after the contest ends, so you should have time to request logs from the ARRL, fill them in, and mail them. If you transcribe NR contest entries from your original log, be sure to repeat all contact information on the forms to be turned in. ARRL entry forms and summary sheets should also be requested to accompany your contest logs. Send a self-addressed and stamped envelope (s.a.s.e.) with your request for

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CIRCLE 33 ON READER SERVICE CARD

CIRCLE 166 ON READER SERVICE CARD

these ARRL forms and send your request without delay. The ARRL also has contest check sheets. You should request the ARRL forms immediately so that you will receive them in time for this contest.

Submitted Material. The contest material submitted to the ARRL is not returned, so do not send your only (original) log sheets. It is a simple matter for most of us to duplicate material before mailing it to the ARRL. Take your time and try to submit correct material that is easy to read. Checking contest entries is a tough job, but you can make it easier for League checkers by turning in good material. The League appreciates receiving check logs from General, Advanced, Extra, and DX operators who take part in the NR.

Scoring

Contact Points. One point is earned for each station contacted while on the air in the NR, whether or not contacted amateurs are participating in the contest, as long as the report and ARRL section are obtained.

Code Proficiency Points. If you have an ARRL code proficiency certificate, your stated receiving speed (words per minute) is added to your point total for the stations you contacted. If you do not hold an ARRL code proficiency certificate, or if you want to increase the rate shown on your certificate, you can submit your January or February W1AW or W6OWP qualifying copy with your NR material to claim these extra points.

Multipliers. The total number of points derived from your contest contacts and your ARRL (not FCC) certified code proficiency rate are multiplied by the number of foreign countries and ARRL sections you contacted during your NR contest operation. Remember that Alaska, Canadian Provinces, Hawaii, and the West Indies (Guantanamo Bay, Puerto Rico, and Virgin Islands) are ARRL sections and they do not count as countries in this contest.

Summary

I hope to contact you on one of the Novice bands. I was never a Novice because that class of license did not exist when I was getting started in our amateur radio service. Nevertheless, I work about 1,000 Novice band contacts every year, and I have participated in each Novice Roundup. When the NR contests were held in the 1952 through mid-1970 era, the Novice license was just valid one year. It could not be renewed, and it was not available to anyone who had previously held any class of amateur radio operator license. In that time frame, no Novice could compete in more than one NR as a Novice, and newer Novices seldom participated at all. Novice licenses are now valid a maximum of five years and they can be renewed, which means that Novices can be experienced in previous

NR contests, and improved scores should result. Similarly, it is a relatively recent change that allows Technicians to use the Novice code bands. Enjoy this contest by putting your station in top condition and reserving adequate good operating time during the NR.

NR contest activity has always been slow at the start, and it is common to have other operators request an explanation of contest rules. I advise you to direct them to NR coverage in this column or in other magazines, which is simpler and better than trying to give all this information to each amateur who requests it. NR activi-

ty continues to build as the days pass and more amateurs become aware of it. By the last day of the contest, activity is excellent. If you get this issue before the contest starts, please mention the Novice Roundup to every amateur you contact to let them prepare for this excellent contest.

As usual, the cooperation of the ARRL has been excellent during the preparation of this contest announcement. I particularly appreciate the help provided by Bill Jennings, K1WJ, the NR Contest Manager.

73, Bill, W6DDB

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| ■ VX-15 External VXO (one crystal supplied) | \$53.50 |
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Photo shown MX-15, VX-15, PL-15, SP-15, MS-1 and PR-1

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CIRCLE 22 ON READER SERVICE CARD

The Austin Superlite 2 Meter Beam

At a convention in New England I had the pleasure of meeting Dick Austin of Austin Antennas. Dick had a display booth at the convention where he introduced his new amateur line of antennas. I was particularly interested in his 2 meter beam, which used different techniques than one is accustomed to in manufactured antennas. The result of that meeting is this product review.

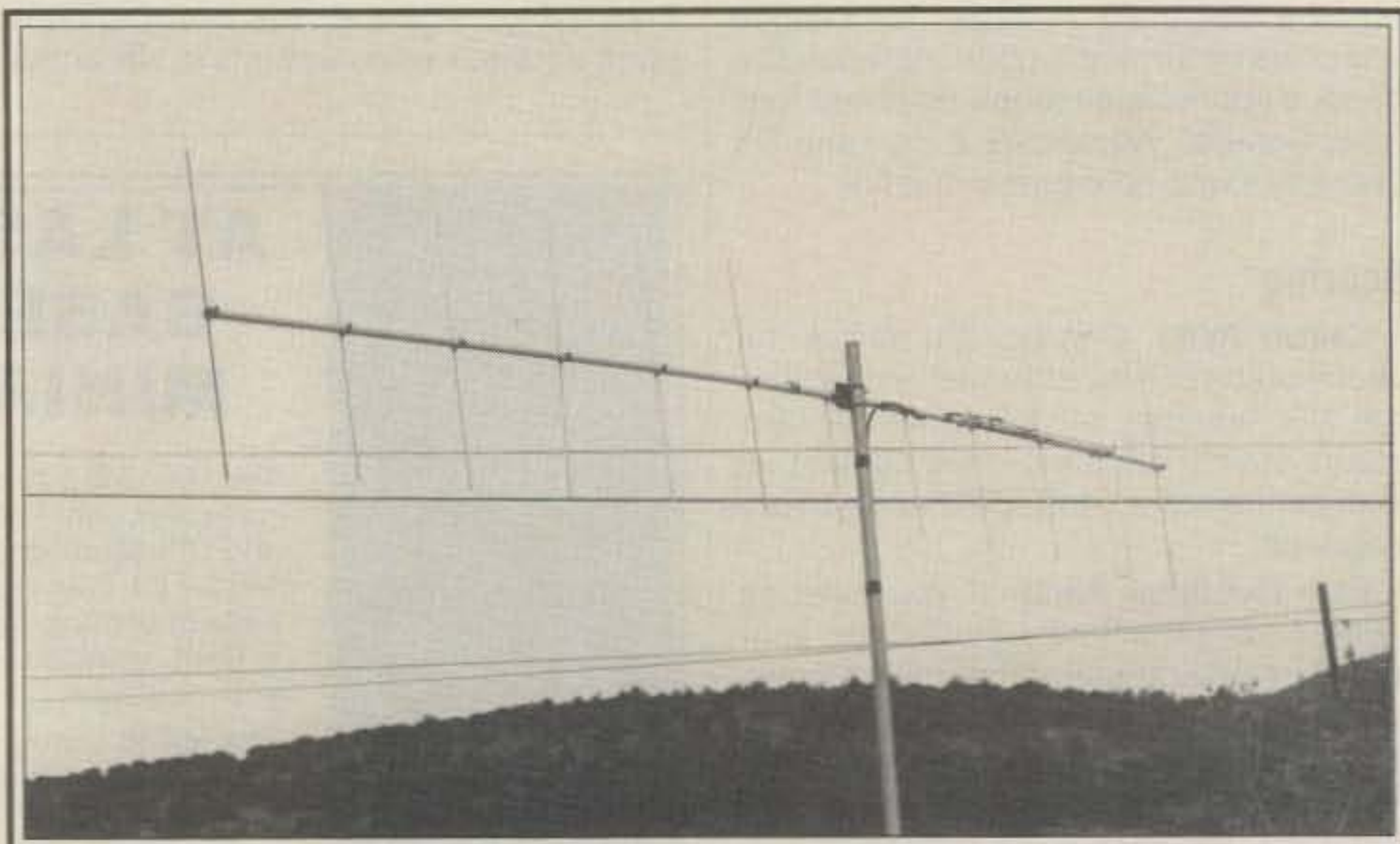
I installed an Austin 2 meter beam here in Silver City, New Mexico, where we experience very high winds and occasional severe storms (I am on the Continental Divide at 6000 feet plus). The beam has gone through one year of testing and use, and I can state that it suffered no ill effects whatsoever from the weather or storms.

The Superlite Model I tested is a 12-element beam with an overall length of 2.2 wavelengths. It has one reflector and 10 directors. All elements, with the exception of the driven one, are $\frac{3}{8}$ inch O.D., 5000 series aluminum. (In case you don't know what 5000 series material is, it is extremely strong aluminum that isn't inclined to bend or fall apart.) There are two important differences in this beam versus many others. First, the boom is 1 inch I.D. spiral-wound fiberglass (the fiberglass is made especially for this antenna). More about the boom in a moment. The other important feature is the feed method, which certainly is unconventional.

The beam is designed for 50 ohm feed. A folded dipole is used for the driven element. It is constructed from a specially annealed aluminum that can be bent at 90 degrees without danger of cracking. The dipole feed point is connected to "Q" bars and then to a 4 to 1 transformer which also serves as a balun. The transformer is made from 0.141 diameter semi-rigid tubing. This tubing is made by Precision Tube (Wales, PA). It is only 0.141 inch in diameter as mentioned, but will handle a kw. The outer tube is copper and the center conductor is silver-covered steel wire. Special machining is used to mount a coax connector on the end of the transformer so that standard coaxial feedline can be used.

The total weight of the beam is about 5 pounds (which isn't very much for a 12-element antenna.) I have never weighed 1 inch diameter aluminum tubing versus the same diameter fiberglass, but I would assume the latter is lighter. One point the manufacturer makes in using the fiberglass boom is that the boom cannot degrade the beam pattern as metal might. This is a good point, because in my experience, interlacing different beams on the same support can sometimes foul up the desired patterns, front-to-back, gain, etc. Using a non-metallic boom eliminates this.

*Technical Consultant, CQ, 200 Idaho St., Silver City, NM 88061



This is the Superlite 144-12SK mounted in place.



This shot shows the matching network and driven element described in the text.

Without having access to a good antenna range and testing facility (and I don't), it is impossible to provide accurate gain and front-to-back measurements. However, I did run many "A" versus "B" tests. I used both a quarter-wave vertical and a good three-element beam, tested against the Superlite. The antennas were at the same height, and positioned about

25 feet apart to avoid coupling. Checking with a local amateur about one mile away, line of sight, produced some interesting results.

In all instances the Superlite far outperformed the three-element beam. However, what was more meaningful were the checks I made on various repeaters in the area. When I say "the area" here in the southwest I am re-

ferring to repeaters between 50 and 100 miles away. I had always had problems with some of these repeaters with the three-element job; I couldn't even hear them with the quarter-wave. However, with the 12-element Superlite I no longer had any difficulty capturing any of the machines that had been "flaky." I would have liked to try the beam in a v.h.f. antenna-measuring party. I have the feeling that it would be a solid performer against any other 12-element job.

The other important test concerns the standing-wave ratio or the match on the antenna. The beam I tested was tuned to 146.5 MHz because I wanted to use it primarily for repeater work. I expected the beam to be rather broad-banded because of the folded-dipole driven element and the "Q" bars plus matching transformer, and that is exactly how the beam checked out. The s.w.r. was less than 1.4 to 1 from 146 to 148 MHz. It should be pointed out that I used the beam in a vertical configuration, but it can be used either way. It simply means rotating the boom 90 degrees to go to horizontal polarization.

The beam comes in what Austin calls a "semi-kit" with a complete set of instructions. However, I actually didn't find the "semi-kit" very much different from any other commercial beam I have had to put together. In fact, it took about an hour. Austin Custom Antennas makes several models for both 2 meters and 220, plus commercial and marine antennas. I would suggest writing for their catalog for more information. The antenna I tested sells for \$94.95 and is designated the 144-12SK. For further information write to Austin Custom Antennas, 38 Terminal Rd., Providence, RI 02905 (telephone 401-461-1408). 



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A LOOK AT THE WORLD AROUND US

New Gear For The New Year

We're changing style slightly for this month's column. Rather than discussing a particular amateur specialty or new idea, we're highlighting some attractive items and their related areas, which can open new doors for your long-time enjoyment. During following months we'll return to coverage of aspects such as revitalizing lost audio quality of s.s.b., the 20 meter beacon network, the new OSCAR 10, AMTOR, etc.

Although an economically depressed period for many geographical areas, 1983 was a banner year for amateur radio. In addition to the successful launch and orbiting of OSCAR 10 and 30 meter's acceptance as an exciting new band, RTTY reached new heights of popularity and its operational regulations were relaxed. The fall equinox kicked off another exciting season for 10 meter f.m., while both 2 meters and 70 centimeters are booming as never before. These u.h.f. bands are destined to become the prime communications frequencies of future times. SSTV also underwent a series of trials, tribulations, and advances, with some exciting color video systems emerging for use by everyone holding a General or higher class license.

Now may be the ideal time for adding one or two new pieces of amateur gear to your collection to further your enjoyment in our exciting world of amateur radio. Let's face it, gang, where else could one get such favorable returns for such reasonable expenditures? Continuing with ideas along these lines, let's look at a few of today's many items which easily might put that new flair in your activities.

Kenwood's Talking Rig: The TW4000A

Sightless amateurs and congested traffic mobilers can now enjoy 2 meter and 70 cm f.m. activity in a refreshing new way, thanks to Kenwood's new TW4000A. This dual-band transceiver covers 144.0 to 148.0 MHz and 440.0 to 450.0 MHz with 25 watts high power output on both bands. There are two v.f.o.'s and ten memories which can be used "mix and match" fashion between bands, plus a priority channel watch function, band scanning, memory scanning, programmable scan lockouts, memory locations for "odd splits," and an "alter-



Kenwood's new dual-band TW4000A. It's flashy, it beeps, and it talks back in either of two languages.



The MFJ-1224 Computer Patch, compatible software, and a home computer provide a flexible and inexpensive way to join the fun of RTTY today.

nate between two frequencies" function. Frequency steps are 5 or 10 kHz selectable on 2 meters and 5 or 25 kHz selectable on 70 cm. There are also switches for scanning only 2 meter memorized or 70 cm memorized frequencies.

A large multi-function LCD readout covers nearly half the unit's front panel, with rear lighting providing a green and black display. In addition to indicating frequency, it shows signal levels, memories, offsets, v.f.o. A or B, priority watch, scan mode, frequency busy, on air, and the band in use. A scanning tone-encoded mike is included.

Probably the most unique feature of this rig is its ability to directly tell its operator of its actions when the optional VS-1 voice synthesizer is installed. The TW4000A announces power on (at initial turn-on), U or V for the appropriate band, A or B for the appropriate v.f.o. (or a number if memory recall is being used), followed by a number, a decimal and three more numbers for frequency, and plus or minus for transmitter offset (simplex isn't announced). As each memory is recalled, the synthesizer again announces all new parameters. There is also a front-panel pushbutton for initiating an immediate

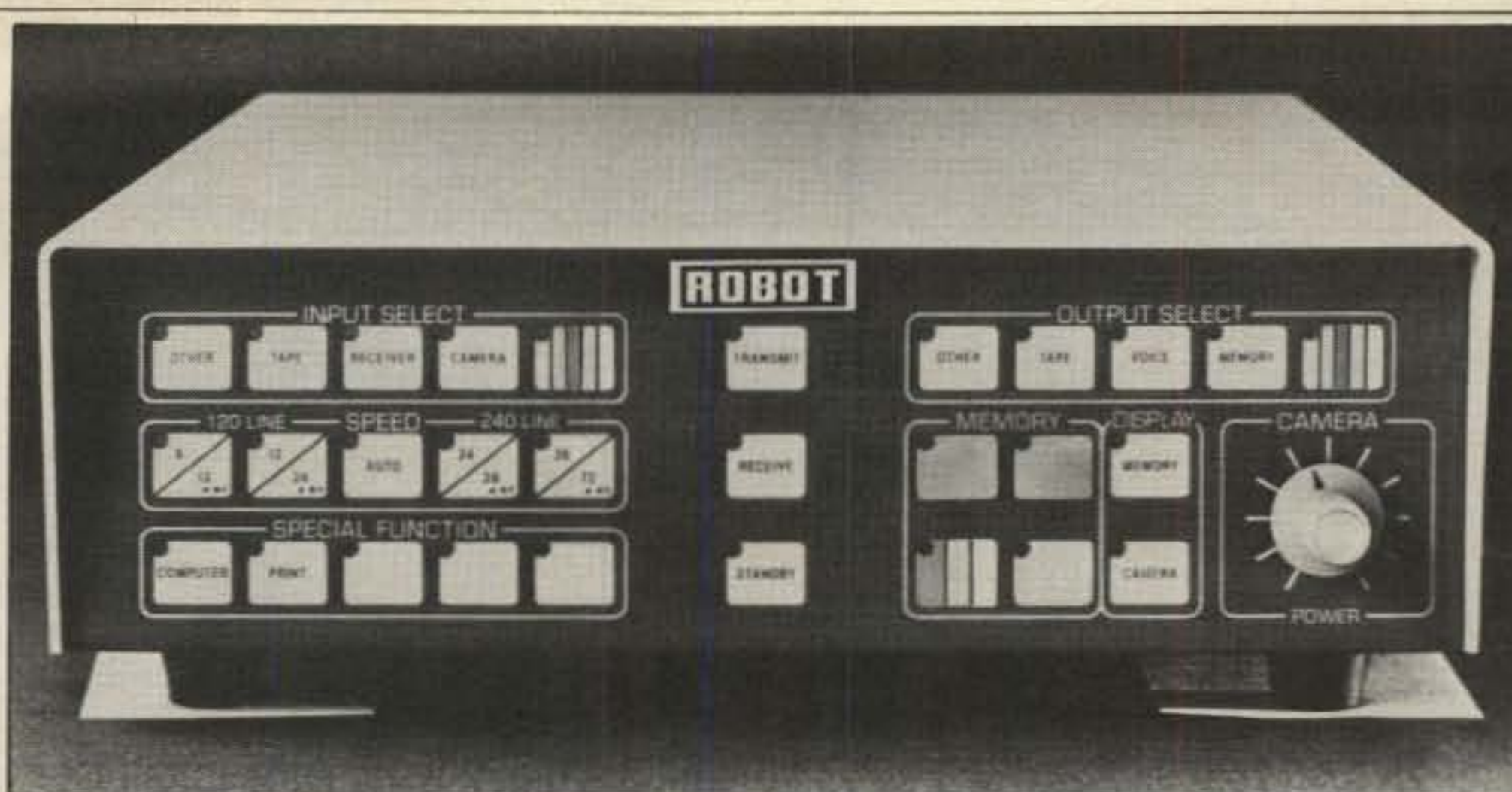
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announcement of existing operating parameters. On the "far out" side, the voice synthesizer can be set to talk slowly, medium, or fast; it can be adjusted to talk softly, normally, or loud; and it can be switched to talk in English or Japanese. Call this rig something evil and it can rap back at you! Seriously, however, talking rigs are a new "twist" which holds merit, especially when u.h.f. activities wane. Check out one yourself. They are impressive.

Computerized RTTY Inexpensively

If you are thinking of purchasing a home computer, consider setting up the unit to also work RTTY on an occasional or "as available" basis. There are (hardware) interfaces and (software) programs available for mating with almost any rig and computer, and today's world of RTTY is a truly fascinating area. Written message-type communications are being complimented by electronic mail-boxing and selcal techniques, while high-speed c.w. interest is growing as never before. There is a completely new group of enthusiastic amateurs enjoying these modes, and they are quite understanding of curious newcomers.

One of the least expensive ways of rigging a computer/RTTY setup involves using the MFJ-1224 interface, Kantronics "Hamtext," and a Commodore VIC-20. An unbelievable number of those computers were reduced to the \$75 class be-



The Robot Research model 1200 color SSTV scan converter can open new horizons of amateur video DX. The unit is compatible with all presently popular slow-scan formats.

fore being replaced with the Commodore 64. If diligent hunting doesn't help, you can opt for another type of computer and a mating "Hamtext" software package.

The MFJ-1224 interface is a very flexible unit which can be used with the Kantronics, RAK, or AEA softwares, or you might "roll your own" with the help of computer-buff friends. The unit features both mark and space demodulators; RTTY, ASCII, and c.w. operation; and it copies 170, 425, and 850 Hz shifts. Interconnecting the system usually takes only a few minutes. The interface connects to a computer's joystick or modem port via

a software-packaged cable, and then shielded leads connect to the h.f. rig's speaker, key, and mike input. Finally, the RTTY program is loaded into the computer and you're ready to enjoy new-found action.

Some amateurs have bypassed RTTY involvement, citing their poor typing ability or the problems of rigging a system. This system initially assembles in less than an hour. If the computer is then removed for other uses, reinstalling it in the shack shouldn't take over five minutes. Keyboard entanglements can be alleviated by using software with large type-

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Looking for a low-cost way to join the fun and excitement of 10 meter f.m.? Check out this compact Heil Sound transceiver.

ahead buffers and by latching onto a computer program in touch typing. Then, too, RTTY monitoring with a good frequency guide is a lot of fun.

Color SSTV System

As previously mentioned, slow-scan TV has experienced some radical changes during the last year. Color systems of several different formats have come into vogue, and Robot Research, Inc. is clearing the way for newcomers with their new model 1200C color SSTV converter. Featuring the capabilities of eighteen 65K memories, the unit is compatible with all present formats from the originally popular 8 second black-and-white technique to frame sequential or single-frame color in 120- or 240- line modes. When using this unit, the only adjustments you need make are asking the other station's parameters and punching the appropriate front-panel keys. They're all there: black and white with 120 lines in 8 or 12 seconds, 240 lines in 24 or 36 seconds, and color with 120 lines in 12 or 24 seconds, or 240 lines in 36 or 72 seconds. You can even store multiple pictures or send and receive 3-D views with the system. Retrofit kits are also available for those of you with Model 400 Robot scan converters. Contact Robot Research, Inc., 7591 Convo Court, San Diego, CA 92111, for pricing and delivery.

Numerous amateurs around the globe are presently active with color SSTV on the h.f. bands, and some of the views are truly fascinating. It's an interesting and exciting new mode, and station interconnections are really a simple matter. The scan converter is connected to an h.f. transceiver via cables to the mike and speaker, and the converter's output is connected to a color monitor or television set (an r.f. modulator is included in the 1200). Finally, a VCR-type color camera is connected to the converter's video input. That's all there is to it. Color TV cameras are decreasing in cost (a Nitachi GP41D, for example, was recently advertised for \$400), and they can also be used with fast-scan ATV setups or home video



The Guild radio rack provides an attractive and functional home for TS830-size equipment. Photos simply do not do justice to this piece. It is sharp! Guild also manufactures a similar rack for Apple computers and their disc drives.

recorders. Considering the rising trends of taping rather than filming home movies, the purchase of a color video camera now seems quite logical.

10 Meter F.M.: A Special Treat

There is a very special world of amateur f.m. activity residing on the upper end of 10 meters, and you can join this excitement in a fairly easy manner. If you aren't familiar with the 10 meter f.m. scene, consider the following description in a nutshell.

Visualize a channelized f.m. arrangement similar to 2 meters complete with repeaters and crossband links, yet boasting the DX and propagation characteristics of 10 meters. A typical 5 watt rig can work coast to coast simplex when the band is in fair shape, and intercontinental contacts are a blast when the band is fully open. Japan and Australia can be worked either "direct" or through west coast repeaters, and European amateurs are often contacted via repeaters on either continent. Some amateurs set up their

own "2 to 10 links" by simply interconnecting their f.m. rigs and accessing the arrangement with a hand-held talkie. Others add tone control for beam antenna rotation, amplifier switching, etc. (10 watts is the "usual" power on 10 meter f.m.).

The 10 meter f.m. band is situated between 29.500 and 29.700 MHz, with 29.600 MHz being used as an international calling and "direct" working frequency. Repeater input/output separations are 100 kHz, starting at 29.520 and usually progressing in 20 kHz steps to 29.580 kHz. We feel quite confident saying if you like 2 meter f.m. you'll love 10 meter f.m.

A very attractive and inexpensive 10 meter f.m. transceiver is the FM10T, which is available from Heil Sound System, Marissa, Illinois 62257. This little gem covers 29.3 to 29.7 MHz with 5 watts output and some very good sounding audio. Available in either kit or wired form, the assembled version includes the added options of a 6 kHz f.m. filter, repeater offset crystal, and microphone. This perfect companion for your 2 meter rig could open new worlds of f.m. enjoyment.

Guiding Your Setup

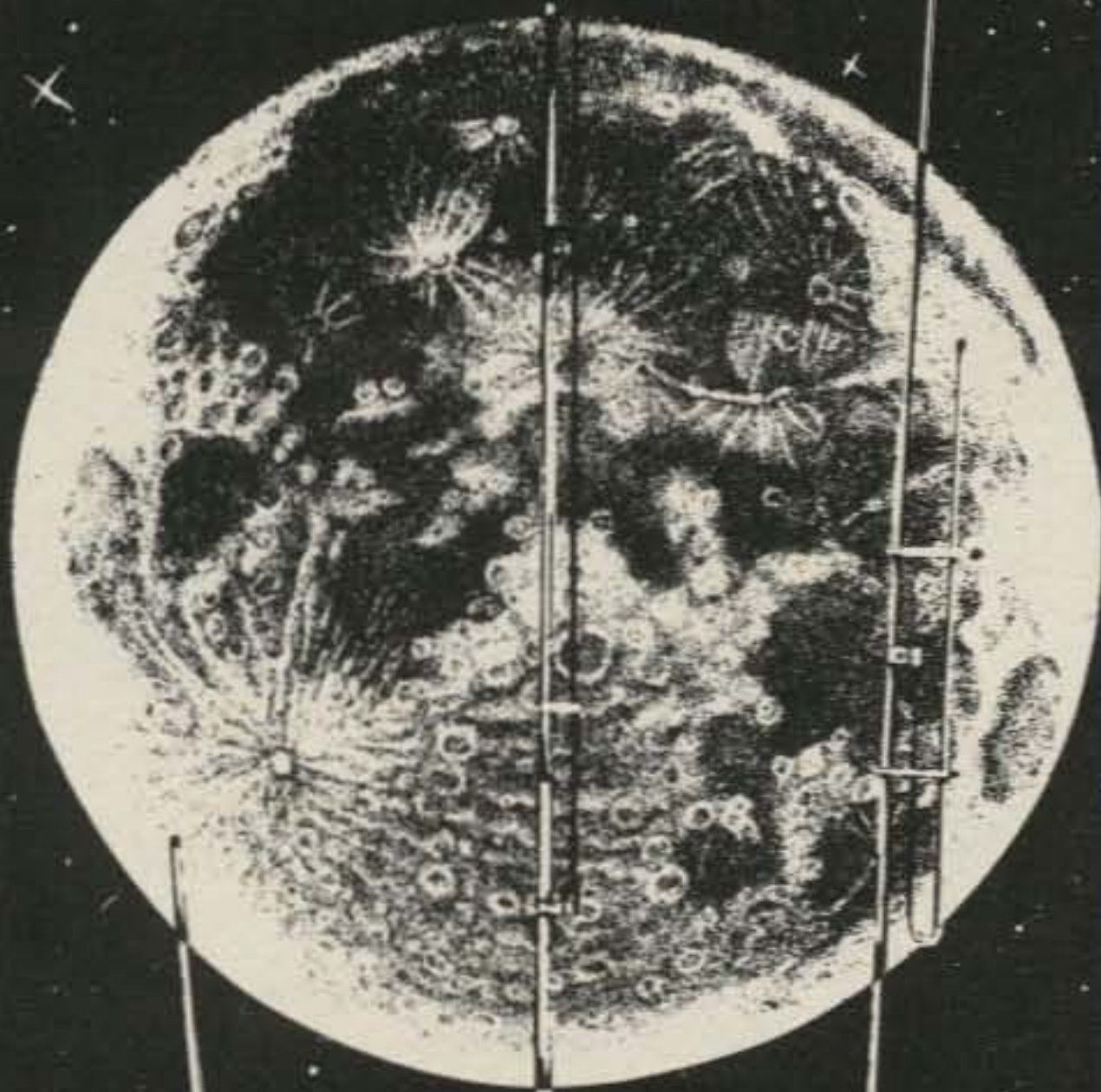
Although the Guild radio rack doesn't directly open any new doors in communications technology, it does provide an attractive and functional way to assemble your multi-unit station. That capability will definitely be appreciated once you're delving into some new area and the extra pieces start overfilling your desk! The rack is designed to hold Kenwood's TS830 or 530, speaker, and v.f.o. Other units of similar size could also be housed in the rack. The completely open rear area, side cutouts, and extra side space permit good air circulation. There's no need to move any wires when installing the rack. Merely sit it over the rig, slide in the accessories, and enjoy. The bottom section is 15 $\frac{5}{8}$ " x 7" (inside); top sections are 7 $\frac{1}{2}$ " x 6" (inside). Outer dimensions are 16 $\frac{7}{8}$ " W x 14 $\frac{3}{4}$ " H x 14 $\frac{1}{2}$ " D. Guild is a long-time manufacturer of quality musical instruments, and their outstanding craftsmanship is reflected in this rack. It's built like a battleship, yet it's a nice piece of furniture.

Your Turn

That's the view for this time, gang. We hope you enjoyed the thoughts, and we invite you to write to us directly on areas you would like to see covered in future columns. While you're at it, tell us something of yourself. What is your present h.f. rig, and how would you rate it? How long have you used it, and what did you use previously? What would you consider your "dream rig," and why? We'll present the survey results along with some special ideas in a future column. Now let's hear from you!

73, Dave, K4TWJ

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A power connector is supplied on the top of the units. Twelve volts applied there will power the unit as well as charge the battery pack. For further information, contact ICOM America, Inc., 2112 116th Ave. N.E., Bellevue, WA 98004, or circle number 107 on the reader service card.



Palomar RTTY/ASCII/C.W. Computer Interface

Palomar Engineers has announced its new computer interface Model CI-103. It connects between your rig and home computer and lets you send and receive RTTY, ASCII, and c.w. using a VIC-20, Apple, TRS-80C, Atari, TI-99, or Commodore 64 computer. The CI-103 copies on both mark and space with a dual diversity combiner that gives much improved reception in the presence of noise and fades. It receives both amateur and commercial shifts and features both pre-and post-limiter filtering, keying for either plus or minus polarity, regulated voltages for stability, and a three-lamp indicator system for easy tuning. Operation is from 12-24 volts d.c. or from 115 volt a.c. with optional adapter.

The Model CI-103 retails for \$139.95. For further information, contact Palomar Engineers, 1924-F W. Mission Rd., Escondido, CA 92025, or circle number 102 on the reader service card.



Info-Tech AMTOR Converter

The Info-Tech M-44 AMTOR Converter allows most RTTY terminals to be used on the recently approved AMTOR RTTY mode. Interface to the terminal is via serial TTL or RS-232 levels, and either ASCII or Baudot terminals may be used. The unit also features a built-in modulator and demodulator with pre-filter, full time ATC, and two transmit buffers. All control of the M-44 and transceiver are simple commands entered via terminal keyboard.

This converter is American designed

and manufactured and will operate in the ARQ, FEC, and ARQ monitor modes. The M-44 is priced at \$379.95. For more information, contact Digital Electronic Systems, 1633 Wisteria Court, Englewood, FL 33533, or circle number 101 on the reader service card.



Trio-Kenwood VC-10 V.H.F. Converter

Trio-Kenwood has developed the VC-10 optional v.h.f. converter which allows the R-2000 to receive signals in the 118-174 MHz range. Through use of microprocessor technology, frequencies in this range may be tuned, displayed (full frequency in kHz., i.e., 146000.0), stored

in memory, recalled, and scanned, using the R-2000 front-panel controls and frequency display, allowing maximum convenience and ease of operation. This optional accessory converter unit may be easily installed on the rear panel of the R-2000. For more information, contact Trio-Kenwood Communications, 1111 West Walnut Street, Compton, CA 90220, or circle number 104 on the reader service card.

Jensen Tool Kit

The JTK-86 "Premier," from Jensen Tools, is a full-service technician's tool kit in a compact zipper case. It includes a selection of tools including a complete 13-piece 1/4" drive socket set with ratchet, spinner handle, and extensions; a Vise-Grip locking plier; 9-blade fold-up hex key set; and 11-blade feeler gauge.

The JTK-86 is available in a vinyl or leather case with handles or in a case of rugged Cordura nylon with three roomy outside pockets for meters, test leads, or service manuals. Two pockets measure 5 1/2" x 9" x 2 1/4", and the third measures 10 1/2" x 9" x 2 1/4". The kit is available with or without a Fluke 8021 Digital Meter or a Triplet 310 VOM. For more information, contact Jensen Tools Inc., 7815 S. 46th Street, Phoenix, AZ 85040, or circle number 106 on the reader service card.



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NEWS OF COMMUNICATIONS AROUND THE WORLD

*Oh, give me a home where the DXers roam,
Where the Deserving Old Timers play,
Where seldom is heard the rag-chewers word,
And the bands are not QRMed all day.*

January is always a cold month of the year. One would think that any right-thinking DXer would find a warm, sunny spot to wait out the slide in the sunspot cycle, but some do not. Last week one of these was up the hill to raise again some of the never-ending and hardly ever answered questions of DXing.

"Things must have been a lot simpler way back when you were young," he started out, perhaps with a quick gratuitous aspersion, "I'll bet all you old DXers had a lot more fun before they made things so complicated. Wasn't it great to be a DXer back then?"

We were not quick to reply, needing some time to sort out any hidden meanings in his words. DX has always been great, but we were not quite sure whether we were being adroitly insulted or just possibly unappreciated. But thinking back a bit we could not remember any time when one might consider DXing as being easy. DXing has always been hard, sometimes even harder and with long periods of waiting in between the hard times. "Just what do you mean?" we finally demanded, intending quickly to find out whether we were being belittled or just facing another instance of the young DXer's insensitivity to how difficult things really were. The QRPer smiled and we were able to relax just a bit, but we were still listening guardedly.

"Well, I mean just general DXing," the QRPer continued. "As I understand it, way back then if you worked something and it fit the DXCC country criteria it was counted. And when a country did not issue amateur licenses in the usual manner it made little difference. All you had to do was work someone who had managed to sneak a rig across the border and it was good for DXCC, right?"

Of course the QRPer was right. We could recall more than one such instance. Why even back in the 1930s when Mussolini was running the railroads in Italy and no amateur licenses were being issued, Italy was one often worked through a clandestine station on the air. Our fading memory did recollect that back then all a station had to prove was



Over the years if you worked an SU Egypt station, it most likely was one of the two operators in this photo. Standing is Mona Ibrahim Mohamed, SU1MI, with her two children. Seated is Ibrahim I. Mohamed, SU1IM, father of Mona and always a QSO welcomed by a needy DXer. SU1IM and SU1MI have provided a lot of DX from Cairo over the years. (K8PYD photo)

that it was there. Most times the DXer's word was enough.

"And how about some of the other operations back then," the QRPer continued. "I've heard some old timers talk about operations that counted for DXCC in which someone would put a table or something just across a country's boundary, or maybe even just close to it, say he was there, and work a lot of DXCC counters from the near side. And the whole thing was acceptable. No license, no authorization, no nothing! Nothing but pure DXing, right?"

Perhaps the years have lead us to wonder just how pure some of the operations were, but what the QRPer said was interesting, and it was not difficult to recall a number of such instances. The questions were starting to nag at us, however, and a wonder was developing as to just what all this was leading to. "Maybe some of that is true," we said, "but just what are you trying to prove? Most everyone knows that the old days were always the good days, but how does it have any effect now? Tell me!"

In retrospect we should have realized that this one came not to talk about the good old days, but only to use the memories to answer something else on his mind. While old DXers may like to talk of the good days long gone, younger types always seem to lean more towards worrying about the DX that might show tomorrow. "Just wait until they've worked 300 countries," we would often say, "and then they'll have learned some of the real values of DXing." But we still had to probe the depths of the problems of the QRPer before us, and we were still facing the need to get this one to stop asking

questions before we ran out of possible answers.

This QRPer, however, was deep of chest and long of breath and was not giving up easily. He still had more shafts to fling. "Back then," he started anew, "back in the 40s and right after WW II, the DX Country list was very short. I was taking a look at the DXCC totals the other night, and would you believe that back in 1953 W1FH was the top DX Gun with only 253 countries? Heck, even W6AM only had 242 counters and that was for mixed modes! Don didn't even have 200 countries on phone. How can anyone deny that things were not easier back then?"

Frankly, we weren't even thinking of trying. An attempt to explain how a.m. phone was not an endless delight and that directional antennas were hardly common would have been a wasted effort. While we were not admitting anything, we were getting the feeling that all that had gone before from this QRPer was but a prelude of things to come. We had the feeling that this QRPer had not come to talk about those endless warm days and easy DXing of other years, but that he had a fresher bone to gnaw.

One learns, however; one always does. Before the QRPer hardly had a chance to bring up more sticky points, we headed him farther up the hill to the Old Timer. If that one has the reputation of knowing all the answers to DX questions, we were thinking it only fair to let him listen to the QRPer's questions.

Everything the QRPer said was a review of what had gone before. But when the QRPer raised the question as to how much simpler things had been in other days, the Old Timer was on his toes. "Simpler?" he echoed. "Simpler such as what?"

The QRPer shrugged. "Just about everything in DXing," he said. "Why only last year there was that everlasting wrangle over DX lists. Sometimes it seems that it never stops. But a year back some were determinedly working to ban any DXCC credit for any list operation. They are still shaking fingers at lists and never stop raising the question as to whether such operations are DX at all. They even question DX nets. Sometimes you can't get away from the argument that the nets are spoon-fed social affairs rather than true-blue DXing. What do you think?"

We intended to let the Old Timer do the talking, but we were having some thoughts of our own. We thought of some who had raised loud cries over the question of DXpeditions themselves, usually the protestors being pure in heart and

77 Coleman Dr., San Rafael, CA 94901

The WPX Program

Mixed

1071 JG1FVZ 1072 W2LZX

S.S.B.

1623 N0BLD 1626 JL1CHX
1624 EA3DBU 1627 EA8VV
1625 AB4D

C.W.

2226 ND6U 2228 PY1AYE
2227 JA8RII 2229 EA7CHZ

Endorsements

Mixed: 450 JG1FVZ, W2LZX. 500 JH1FVZ, W2LZX. 550 W2LZX. 600 W2LZX. 650 W2LZX. VE2PD. 700 W2LZX. JF1SEK. 750 K7CU. W2LZX. JF1SEK. 800 DK8KC. W2LZX. JF1SEK. 850 W2LZX. JF1SEK. 900 W2LZX. JF1SEK. 950 JF1SEK. 1000 JF1SEK. 1050 W1BWS. 1100 W1BWS. 1150 W1BWS. 1250 UB5-0683. 1450 K9BG. 2250 W2NC.

S.S.B.: 350 EA3DBU. JL1CHX. EA8VV. 400 EA3DBU. EA8VV. 450 EA3DBU. 500 EA3DBU. 550 K7CU. 600 KA3A. 650 VE2PD. 1800 ZL3NS.

C.W.: 400 JA7AZJ. 450 KA7T. K7CU. 500 KA7T. 550 KA7T. 600 KA7T. 650 KA7T. 1550 G2GM. 2000 W2NC.

10 meters: K2SHZ. DK8KC. JL1CHX.
15 meters: K7CU. K2SHZ. W0ULU.
20 meters: K2SHZ.
40 meters: K2SHZ. KL7AF.
80 meters: K2SHZ.

Asia: K2SHZ. GM4DKO.
Africa: K2SHZ.
No. America: N0BLD. K2SHZ. GM4DKO.
So. America: K2SHZ. WB8ZRL.
Europe: KA7T. K2SHZ. EA7CHZ.
Oceania: K2SHZ.

Award of Excellence Holders as of September 1983: K6JG, N4MM, W4CRW, K5UR, K6XP, K2VV, VE3GCO, DL1MD, DJ7CX, DL3RK, WB4SIJ, DL7AA, ON4QX, YU2DX, OK3EA, OJ1MP, N4NO, ZL3GQ, W4BOY, I0JX, WA1JMP, K0JN, K4IEK, KF2Q, W8CNL, W1JR, F9RM, W5UR, CT1FL, W8RSW, WA4QMQ, W8ILC, VE7DP, K9BG, W1BWS, G4BUE, N3ED, LU3YL/W4, NN4Q.

Award of Excellence Holders with 160 meter endorsement: K6JG, W4CRW, W1JR, W5UR, W8RSW, W8ILC, W1BWS, G4BUE, LU3YL/W4.

Complete rules and application forms may be obtained by sending a business-size, self-addressed, stamped envelope (foreign stations send extra postage if air-mail desired) to CQ WPX Awards, P.O. Box 1351, Torrance, CA 90505-0351 U.S.A.

loud in voice in declaring that if a DX station was not operated by an indigenous type, native to and firmly attached to that foreign soil, then the operation was little more than a DX charade and should not be counted. "No DX activity by a transient operator should count for DXCC," was their shout. "No DXCC credit unless the contact is with a resident citizen of that DX country," we mentioned.

"You're kidding!" the QRPer said.

"Not at all," the Old Timer said, moving in to back us up. "And if you think things were simple and everlastingly happy back then, then how about when the early TV sets turned up with an i.f. frequency right in the middle of the 15 meter band? That might give you some different ideas on how DX was then."

As we had suspected, the QRPer did have some ideas other than how good things were in the glorious days long gone. All of the talk moved him closer to the reason for venturing forth into the January weather. "It's this talk about DX-ing taking up too much of the bands," the QRPer finally got around to saying. "When I hear suggestions like that, it

does seem that the other days must have been simpler and happier. Then I hear talk that maybe DX pile-ups should be confined to no more than 10 kHz of a band—just 10 kHz and every station trying to call in that slot." There was a worried look on the QRPer's face. "What do you think it would be like if a rare one like Bouvet or Peter I Island should show up, not to mention a semi-rare one like Albania? Is there anyone who is a true-blue DXer who thinks you could hold the action within 10 kHz?"

Hardly. In other times and other places there have been some big pile-ups, usually never less than 30 over 9 solid QRM. More than one QRP type has learned that neither his head nor his signal was strong enough nor hard enough to break that noise torrent. The only hope is for the QRPer to lurk around the edges, casting in his call from the rim of the noise, where the noise level starts to drop. We could recall when this had been 10 or so kHz away from the center of the high noise area, and it worked—perhaps not as fast as one might desire, but often a bit faster than trying to dive into the noise pit.

"I've heard some of those ideas about restricting DX," the Old Timer said, "but I've yet to hear how such a limit could be enforced. Who blows the whistle; who sets the penalties? Going a bit further, what is the need and what are the enforcing procedures? I'd like to know."

For a moment the QRPer appeared stumped. He had come to ask questions, but was being asked to answer some. "Maybe it will be like the fellow I heard last year at one of the conventions. In the DX Forum he was blasting list operations and demanding that action be taken to deny credit for DXCC for anything worked off a list. Maybe they'll try something like that."

We did not know what the Old Timer was thinking. We were wondering if again we were looking at a situation in which a suggested remedy only targets a supposed problem, but offers no feasible action to correct a real or imagined problem. But the QRPer was not finished—yet.

"I've been listening a lot on the DX bands and talking with the fellows at DX meetings," he continued. "It is hard to understand what can be done. Some have asked if a big DX pile-up is down low on a band, does that mean that they cannot jump in on an action higher up. Others ask how you measure any segment, and if something is going on down in the Advanced or Extra class country, would any activity in the General class country be prohibited." At this point the QRPer was flinging out rhetorical questions without even waiting to hear any answers.

"What about self-policing?" we slipped in when there was a needed pause for breath. The QRPer stopped short.

"Sure, self-policing," we repeated. "Haven't you ever heard DXers complain when a DX station tries to spread the call-

ers out too far? Most DXers understand the need to spread out callers so the DX station can hear callsigns, but also object when the spread is unreasonable, right?" The QRPer had to think over all this.

"Besides," we continued, "most full-bore pile-ups burn themselves out in short order. Undoubtedly there will always be a challenge for all DXers on the first day of operation. It never is the same by the time the third or fourth day rolls around, and even the pile-up which was horrendous on the first day is winding down by the third or fourth day. Eventually one learns that a 333rd contact counts just as much as the first and is a bit easier to come by. QRPers learn that early."

We could see that things might be taking a new slant, but the questions were not finished. "One thing I've never heard an explanation for," the QRPer went on, "is how any pile-up limits might be enforced. One fellow who hinted that he was in the know said that if the pile-ups got too big the whole operation would summarily be disqualified. Another came along, however, and said that such an idea, even if considered, could only apply to DXCC and could not be applied to any other DX award. Yet another said that they would keep a list of those who worked the DX station from outside the segment, and when their card was submitted it would be rejected." The QRPer paused with a puzzled look. "How in the world can such a proposal be considered without thought to the around-the-clock, around-the-world monitoring on all DX bands to detect those who may stray?"

The WAZ Program

10 Meter Phone

259 DK9KK 260 JH1VRQ

15 Meter Phone

180 JH2PYX

20 Meter C.W.

202 K5DYZ 204 W5OG
203 N4TZ

40 Meter C.W.

46 K5AG

All Band WAZ

S.S.B.

2756 ZP5PX 2760 WD9GOV
2757 WB2HYO 2761 G4AHJ
2758 KE4XW 2762 PY4LJ
2759 WB7CEH

C.W. and Phone

5642 PA0JRW 5647 UK2RDX
5643 YU2RMG 5648 UR2QD
5644 DL1FBO 5649 W4WXZ
5645 DJ8TJ 5650 HB9G
5646 DL1FBO

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5 Band WAZ

Standings as of October 1, 1983

All 200 zones worked:

- | | |
|------------|------------|
| 1. ON4UN | 34. IØRIZ |
| 2. K4MQG | 35. ON5NT |
| 3. SM4CAN | 36. OH6JW |
| 4. AA6AA | 37. OK1AWZ |
| 5. W8AH | 38. IV3PRK |
| 6. W6KUT | 39. DJ6RX |
| 7. EA8AK | 40. OH3YI |
| 8. LA7JO | 41. I4RYC |
| 9. EA3SF | 42. ZL1BIL |
| 10. OH1XX | 43. I4EAT |
| 11. EA8OZ | 44. ZL1BQD |
| 12. WØSD | 45. TG9NX |
| 13. KØZZ | 46. XE1J |
| 14. ON6OS | 47. F5VU |
| 15. OK3TCA | 48. W3AP |
| 16. K6SSS | 49. YO3AC |
| 17. ZL3GQ | 50. K3TW |
| 18. OK3CGP | 51. XE1OX |
| 19. SMØAJU | 52. VE7IG |
| 20. OZ3PZ | 53. OK1ADM |
| 21. I3MAU | 54. CT1FL |
| 22. I2ZGC | 55. WA1AER |
| 23. 4Z4DX | 56. N4RR |
| 24. N4KE | 57. UWØMF |
| 25. K5UR | 58. W4DR |
| 26. K9AJ | 59. OK1MP |
| 27. SM3EVR | 60. W1NW |
| 28. LA5YJ | 61. OE1ZJ |
| 29. DL3RK | 62. HB9AHL |
| 30. N4WJ | 63. HB9AMO |
| 31. G3MCS | 64. LA6OT |
| 32. SM5AQD | 65. UR2QD |
| 33. WØMLY | 66. UK2RDX |

The top 9 contenders for 5 Band WAZ:

- | | |
|----------------|---------------|
| 1. N4KG, 199 | 6. W8VUZ, 198 |
| 2. JA3EMU, 199 | 7. LA9GV, 198 |
| 3. N4WW, 199 | 8. K4CEB, 198 |
| 4. W1NG, 199 | 9. K7UR, 196 |
| 5. F6DZU, 199 | |

232 Stations have attained the 150 zone level

At this point we were wondering if there were more questions than the Old Timer might answer, but the QRPer was not through. "What would happen if a DX station showed and flatly declared he would work anywhere he wished in the bands and listen anywhere he wanted to, and if you did not like his frequencies, go elsewhere, and that any DX credit would be your problem and not his. And how about those DXers who work everything that comes down the pike, but never bother to submit for any credit anywhere? They call themselves 'Pure DXers.' How will they be controlled?"

By this time we were thinking that the whole conversation was getting a bit ridiculous. As has been noted elsewhere, those with a cause will come carrying banners with a thousand slogans but not one solution. Then the Old Timer spoke.

"Perhaps we are worrying unnecessarily," he said. "Anything such as these proposals would probably have a trial run elsewhere to see how things go—maybe a short study at a lower level. There are a

lot of considerations to be thought out. There always are."

This got the QRPer going again, and we braced for more questions. However, he came smiling. "You mean maybe something like Field Day of the Sweepstakes?" he said. "You mean they may limit those contests to something like 10 kHz?"

The Old Timer just sat there hardly nodding his head at all. But that was all the QRPer needed. "When they try it in the Sweepstakes they will learn a lot," he said, and away he went down the hill. For a bit the two of us just sat and savored the silence.

"What do you think of all of this?" we had to ask, and the Old Timer was silent. Finally he spoke.

"I think what I've thought for a long time. DXers are the top echelon, and when DXers have the facts, they can figure out things for themselves. That's the way it has always been and that's the way it always should be."

We thought that over for a bit and then started to say something, but we were headed off by the raised hand of the Old Timer. "Think," was all he said, "and don't let anyone try doing it for you." And that was it.

Changes in the CQ WPX Honor Roll

Norm Koch, K6ZDL, who has been guiding the WPX action for some years, has announced that effective January 1, 1984 there will be some changes, these mostly being deletions of prefixes which

CQ DX Awards Program

S.S.B.

1285	W2LZX	1288	W6BCQ
1286	KE4HX	1289	KE3A
1287	DU1RFA		

C.W.

593	W2LZX	595	PY2BTR
594	N6VO		

S.S.B. Endorsements

310	W9JT/313	275	KE3A/287
300	VK4VC/308	275	JH4PRU/290
300	K9BWQ/306	275	W6NLG/287
300	WA4WTG/304	275	I1POR/281
300	W2LZX/303	275	W6BCQ/278
275	W6SN/297	275	KB3KV/277
275	I6PLN/299	275	W4PTT/277
275	I3OBO/295	250	KE4HX/254
275	I8ZTE/294	28 MHz	WA6DTG
275	ACØA/292	28 MHz	KE4HX

C.W. Endorsements

310	K4CEB/313	275	WA2HZR/280
300	K1MEM/303	275	DL1QT/275
275	I3OBO/290	250	PY2BTR/255
275	W2LZX/280	250	KA3R/250

Total number of active countries is 315. The basic award fee for subscribers to CQ is \$4. For non-subscribers, it is \$10. In order to qualify for the reduced subscriber rate, please enclose your latest CQ mailing label with your application. Endorsement stickers are \$1.00. Updates not involving the issuance of a sticker are made free when an s.s.s.e. is enclosed for confirmation of total. Rules and application forms for the CQ DX Awards Program may be obtained by sending a business size, No. 10 envelope, self-addressed and stamped, to CQ DX Awards Manager, Billy Williams, N4UF, Box 9673, Jacksonville, FL 32208 U.S.A. DX stations must include extra postage for air-mail reply. Please make all checks payable to the awards manager.



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IC-751	HF Xcvr./Gen. Cov. Rcvr.	\$1219.00
IC-745	HF Xcvr./Gen. Cov. Rcvr.	869.00
IC-740	HF Xcvr.	899.00
IC-PS740	Internal Power Supply For IC-740	135.15
IC-R70	HF Gen. Cov. Rcvr.	599.00
IC-CK70	12VDC Option For IC-R70	9.95
IC-PS15	12VDC, 15 Amp, Power Supply	131.12
IC-PS20	12 VDC, 20 Amp, Pwr. Supply/Spkr.	199.00
IC-SP3	External Speaker	49.50
IC-271A	2-Meter, FM/SSB/CW, Xcvr.	609.00
IC-PS25	Internal Pwr. Supply For IC-271A	99.00
IC-SM5	Desk Microphone	39.00
IC-SM6	Desk Microphone	39.00
IC-EX310	Voice Syn. Unit; IC-751, 471A, 271A	39.95
IC-GC4	World Clock	99.00
IC-25H	2-Meter, FM, 45 Watt Xcvr.	339.00
IC-BU1	Mem. Back-Up; IC-25A/H, 290H, 490A	38.50
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IC-2AT	2-Mtr., FM, Handheld W/Touch-Tone	214.50
IC-02AT	New 2-Mtr., FM, Handheld With T-T	309.50
IC-3AT	220 MHz., FM, Handheld With T-T	234.50
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IC-BP3	8.4 VDC, 250 ma., Ni-Cad Batt. Pack	29.50
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IC-MB10	Mobile Bracket; IC-25A/H, 45A Size	19.50
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IC-EX257	FM Unit For IC-R70	38.00
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FL-32	CW Filter For IC-720A	59.50
FL-33	AM Filter For IC-751	31.50
FL-34	AM Filter For IC-720A	49.50
FL-44A	SSB Filter For IC-730, 740, 745, R70	143.10
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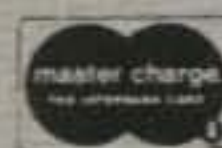
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Say You Saw It In CQ

January 1984 • CQ • 95

have not been available for some time. The deleted prefixes that will no longer be accepted nor counted for WPX credit include: DT (all), EA0, GC (all), MP4, OQ, PK (all), VO4-6, VP1-6-7, VQ (all), VR (all except VR6), VS (all except VS5-6), XV, ZB, ZC3-4-5-6, ZD1-2-3-4-5-6, ZS7-8-9, 1M4, 3V8, 3W8, 8F. Previously deleted were FA, FE, FF, FI, FL, FN, FQ, and HE. The prefixes listed above were deleted after considerable input from concerned DXers. It was done for the continuing goal of making the CQ WPX Honor Roll accessible to all active radio amateurs and to minimize any undue advantage to old timers.

The administration of the WPX program is a lengthy and time-consuming task, and while Norm can field the normal queries and requests, the limited time sharply precludes lengthy correspondence on administration points of the WPX Award.

Clipperton

Ross Forbes, WB6GFJ, has passed the word that the planned Clipperton effort scheduled for March or April is on track and all the needed items are falling into place. Ross visited Papeete early last fall, meeting with the FO8 operators of the radio club there, CORA, as well as having Stan Wisniewski, FO8IW, visit the states to work out any needed planning at this end.

The FO8 operators have the license in hand for the Clipperton operation as well as the needed landing permission. Final transportation arrangements are being completed, and with the long and careful planning for the effort, no special problems to slow or delay putting Clipperton on the air are anticipated.

A month or so back the roster of operators for the trip included FO8BI, FO8DO, FO8EM, FO8IW, FO8JD, WB6GFJ, W6OAT, W6SZN, N6PO, and K1CC. While this list was rather solid, there may be some additions. FO0XX has been the call issued for the DXpedition, and this will be the only call used. Operation planning includes study of propagation conditions expected with the intent to make the maximum number of contacts with the maximum number of countries. There will be a number of languages spoken within the group of operators, including English, French, Spanish, Japanese, Polish, and Russian. There will be further information released on the effort as the departure day nears. Ross Forbes, WB6GFJ, Box 1, Los Altos, CA 94022, is the stateside liaison for the effort.

The Colvins

Lloyd and Iris Colvin departed just before Thanksgiving and headed towards South America for some extended DX activity. At the time of their departure they were planning to visit HC Ecuador, OA Peru signing 4T4WTY to mark World Telecommunications Year, CP Bolivia,

CE Chile, HK Colombia, LU Argentina, CX Uruguay, and ZP Paraguay.

The Colvins mostly will be found on the low end of the c.w. or phone bands and they will make special efforts on the 30, 40, 80, and 160 meter bands. While they would like all the QSLs and QSOs they can get, they would appreciate a limit of one QSO per band per country on this trip. QSLs go to The Yasme Foundation, Box 2025, Castro Valley, CA 94546 (s.a.s.e. or s.a.e./IRC needed).

Lloyd, W6KG, and Iris, W6QL, have been making DXpeditions for many years, possibly longer than the memory of some living DXers. For sure they've been going out for some two decades now and have shown in a lot of stops, some very rare, some medium rare, but always with a big total of QSOs. Both are members of the DX Hall of Fame and are a pair of dedicated DXpeditioners.

Desecheo

Looking at the first week in January, Rodolfo Santo, HI3RST/KP4, and Jose Maldonado, WP4ATF, were aiming to put Desecheo on the air again. Early details on bands and frequencies were sketchy, but the early January period was rather solid. Keep watching for them signing their calls /D and note that one of the calls involved is a Novice class call. They initially planned for a three-day effort.

Those W/K Prefixes

Some with long memories may recall that at one time there was little need for prefixes. You just signed something like "6XAC" or a variation. But Bob Baird, W9NN, passes along a copy of a letter he received in 1928 from the Department of Commerce which pointedly advised him that after October 1, 1928 a "W" would

CQ DX Honor Roll

The CQ DX Honor Roll recognizes those DXers who have submitted proof of confirmation with 275 or more ACTIVE countries for the mode indicated. The ARRL DXCC Countries List is used as the country standard. Honor Roll listing is automatic when submitting application or endorsement for 275 or more countries. Deleted countries do not count and are dropped from listing as they occur. This report reflects the deletion of Serrana Bank, Bajo Nuevo, and the SAI Neutral Zone. Total countries are now 315. To remain on the CQ DX Honor Roll, annual updates are required. Honor Roll updates may be made at any time, in any number. Updates indicating "no change" will be accepted to meet the annual requirement. All updates must be accompanied by an SASE for confirmation. The fee for endorsements involving the issuance of a sticker is \$1.00. The basic award fee is now \$4 for CQ subscribers and \$10.00 for non-subscribers. Please attach your latest CQ mailing label to qualify for the \$4.00 rate.

C.W.

W6PT	315	K6JG	311	N4MM	303	W7CNL	292	W2LZX	280
DL7AA	314	N6AV	310	K1MEM	303	AB4H	291	WD9IIX	279
ON4QX	314	N6CW	308	WA8DXA	302	N5DX	291	K9IW	279
W3GRS	314	W4BQY	308	K9QVB	302	I3OBO	290	W4BV	277
W9DWO	313	W4OEL	307	SM3EVR	300	W1WLW	289	YU2RTW	277
K4CEB	313	K6LEB	306	K3FN	298	SM6CST	286	N8MC	277
W8KPL	313	W1NG	306	OK1MP	298	W9RY	283	WB4RUA	277
N4PN	313	DL3RK	306	DJ7CX	297	K8PYD	281	K8LJG	277
K6EC	312	K4XO	305	W6SN	295	K7ZR	280	K4SE	275
K9MM	312	W9BW	304	W0SP	295	WA2HZR	280	DL1QT	275
W6ID	311	AA6AA	303	W0IZ	292	I5XIM	280		

S.S.B.

K2FL	315	EA4LH	310	W8JXM	303	I8ZTE	294	VE3MV	283
W6EUF	315	OE2EGL	310	W6DN	302	K4SE	293	AE5B	282
K6WR	315	DK2BL	310	VK3JF	302	WD8MOV	293	CT1UA	282
W3GRS	315	W0SD	310	K1MEM	302	WD9II	293	AI9R	282
W3NKM	315	I3LLD	310	G4CHP	301	WB4UBD	293	TG9EP	281
DL9OH	315	K9RF	310	N6OC	301	WA4LOF	292	I1POR	281
W4UG	315	K5OVC	310	VE3FJE	301	AC0A	292	KB5FU	281
W9DWO	314	OE3WWB	310	K9HQM	301	W8ILC/QRp	292	WB4KTG	281
I0AMU	314	VE3GCO	309	WB4NDX	301	W9RY	291	N5AWS	281
F9RM	314	K8LJG	309	W7OM	301	WA4DAN	291	K9TI	280
VE3MR	314	W2SUA	309	WA3HUP	301	KV2S	291	I2MQP	280
IBAA	314	W9SS	309	K8CMO	301	VE3IPR	291	K8ZZU	280
VE3MJ	314	N6AW	309	VE3MRS	301	WB3DNA	291	W8IMZ	279
W4EEE	314	N7RO	309	WB8MGO	300	KB5FU	291	KK0C	279
I0ZV	314	VE7WJ	308	W4OHZ	300	WB6GFJ	291	K8AT	279
XE1AE	313	K4XO	308	YU1DZ	300	JH4PRU	290	W4JFE	279
I4ZSQ	313	W1NG	308	LA7JO	299	JA5PUL	289	EA3KW	279
I8KDB	313	DL6KG	308	A18S	299	KM6B	289	W6MFC	278
W9KRU	313	VK4VC	308	N5FG	299	WD0BNC	289	A18M	278
ZL3NS	313	YV5AIP	308	WA0TKJ	299	W9TA	289	K4BYK	278
VE3GMT	313	K6XP	308	I6PLN	299	K4CXY	289	N9AMF	278
YV1KZ	313	W0YDB	308	W6FET	298	KR9O	289	W6BCQ	278
W3AZD	313	LU3YL	308	K9SM	298	W7FP	288	I5EFO	278
ZS6LW	313	N4PN	308	I8LEL	298	K0GT	288	VE3IUE	278
DJ9ZB	313	4Z4DX	308	K8NA	298	I8KCI	288	KB3KV	277
K6YRA	313	N2SS	307	W2FGY	298	I5BDE	288	KB8O	277
ZL1AGO	313	VE4SK	307	HP1JC	297	N2ATD	288	KP4EQF	277
W4DPS	313	K8PYD	307	DJ7CX	297	K1VHS	287	WB0UFL	277
K6JG	313	OZ8BZ	307	K5DUT	297	EA9IE	287	K9TI	277
W9JT	313	N4KE	306	JH1VRQ	297	W6NLG	287	W4PTT	277
VE2WY	312	N6AV	306	I0MBX	297	AB9E	287	W0IYR	277
F2MO	312	K1UO	306	W6SN	297	KB9KD	287	N7ASL	276
K9MM	312	W8PCA	306	WA0DCO	296	KE3A	287	W0ULU	276
K9LKA	312	W0SR	306	K9IW	296	KC8JH	287	WA6DTG	276
W3GG	312	K9BWQ	306	XE1NI	296	W4BQY	287	ZL1BOQ	276
N4WF	312	YV5DFI	305	IBACB	295	KB3OQ	286	WA2FKF	276
W9BW	312	W8ILC	305	WB1DQC	295	YU2RTW	285	I8INW	275
I8YRK	312	W2CC	305	IV3YRN	295	K8VYV	284	JH4PRU	275
OZ3SK	312	9H4G	304	I3OBO	295	KB5RF	284	W8LKG	275
CT1FL	312	AA6AA	304	K9UAA	295	NA5W	284	W4UNP	275
K6EC	311	WA4JTI	304	K9QVB	295	W0KU	284	WB3CQN	275
W4SSU	311	WA4WTG	304	SM4CTT	295	WB3HAZ	283	WB1EAZ	275
K4MQG	311	XE1J	303	WA9PWN	295	VP9CP	283	VE7BSM	275
W0SFU	311	ZL1BIL	303	W1LOQ	294	XE1OW	283	KZ2P	275
I4LCK	311	XE1KS	303	KB8DB	294	XE1OX	283	K8NWD	275
OK1MP	311	W2LZX	303	AI5I	294	VE3CKP	283	K4LR	275
N4MM	311								

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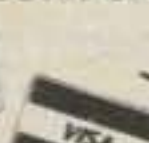
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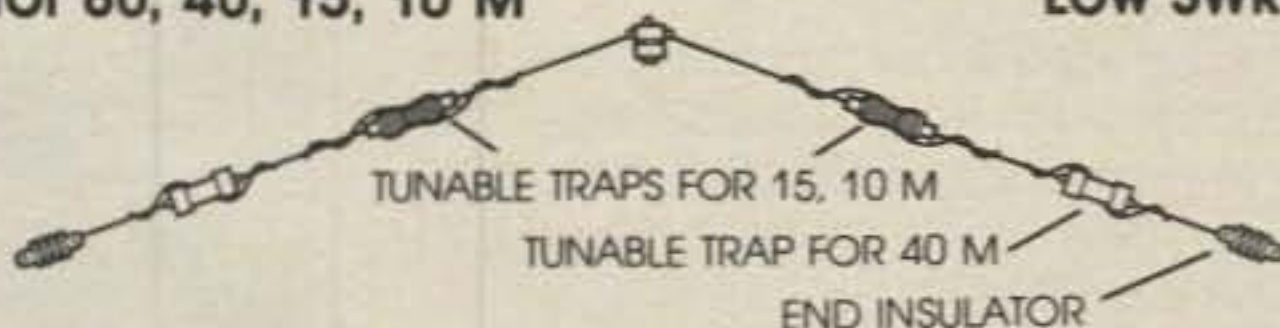
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120 ft.	160, 80, 40 m	Low SWR on all bands. 1.5 KW PEP on SSB, CW; 500 W input on AM, RTTY.	AS-160	\$ 89.50
110 ft.	80, 40, 20, 15, 10 m	Resonant with low SWR on 80 and 40, somewhat higher SWR on 20, 15, and 10.	370-11	\$ 72.50
90 ft.	80, 40, 15, 10 m	Tunable trap antenna with low SWR on all bands. 1.5 KW PEP on SSB, CW; 500 W input AM, RTTY.	AT-80	\$ 79.50
58 ft.	80, 40, 15, 10 m	Tunable trap antenna with low SWR on all bands. 500 W input all modes.	AS-80	\$ 99.50
55 ft.	40, 20, 15, 10 m	Resonant with low SWR on 40, 20, somewhat higher SWR on 15 and 10.	370-13	\$ 65.00
36 ft.	40, 15, 10 m	Tunable trap antenna with low SWR on all bands. 1.5 KW PEP on SSB, CW; 500 W input on AM, RTTY.	AS-40	\$ 75.50
22 ft.	20, 15, 10 m	Tunable trap antenna with low SWR on all bands. 1.5 KW PEP on SSB, CW; 500 W input on AM, RTTY.	AS-20	\$ 75.50
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CIRCLE 8 ON READER SERVICE CARD

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An aerial photo of Desecheo, where some action may be heard in the coming weeks. The usual operating site for DXpeditions is the cleared area on the right-hand edge of the photo. (HI3RST photo)

have to be used for all transmissions, this to be inserted in front of his callsign. The then regular practice of calling "nu 6AA 6AA nu 8AA" had to be changed to "W6AA de W8AA."

This came as a result of the International Radiotelegraph Convention held in Washington in 1927. It provided for the assignment of the "W" and "K" prefixes to the U.S. In retrospect, the "W" prefix lasted until the mid-50s, and when the FCC started to issue the "K" prefix, there were complaints from some amateurs that they were being stuck with a "second class" callsign. When they started issuing the "WA" prefixes, the same feeling was voiced, and a decade or two later there are those who could change their callsign from the WA/WB/WD prefix but will not. Some DXers say their perspec-

tives changed, and some say they just got older and more used to things.

Lord Howe

VK2WU/LH was on during the recent CQ WW DX Test, this one to be QSLed via the VK2 QSL Bureau. If the declining propagation conditions caused anyone who needed Lord Howe to miss out, the well of bitterness should not be bottomless. Already VK2BQQ has announced plans for another effort when spring is in



Bob Baird, W9NN, was at the W9DXCC meeting at Itasca, Illinois, this last fall, Bob coming down from Wisconsin to see how things were going with the DX meeting he help found back in 1953. Of the 54 original participants, only 16 are still left. Bob is still looking for DX, and along the way he has served on the ARRL DX Advisory Committee and the CQ DX Award Advisory Committee, and was a charter member of the QCWA. He says that DX is still as interesting as ever.

the Antipodes, and VK2BQQ/Lord Howe should be heard in November 1984. Patience is always an asset to the DXer, patience along with longevity.

Bulletins

A month or so back a note came from Jim Cain, K1TN, noting that he has finished four full years on *The DX Bulletin* and is working on the fifth. This started some thinking. Back not so long ago the reply to what constitutes a true-blue DXer and when do you know you have arrived was, "When you have stopped calling CQ DX and cannot remember the last time you did!" That is still true, but there are now other guides, and the feeling is that one settles down to serious and intensive DXing when one subscribes to a DX bulletin. Monthly magazines because of publishing deadlines and other constraints cannot meet the need for fast-breaking DX news. Most big-total DXers quickly admit that they could not prosper in DX without the bulletins. When they give it further thought, they just as quickly acknowledge that they really moved up into serious DX and high-total contention when they subscribed to a bulletin.

Where do you find these bulletins? Not on your local newsstand. They are found easily if you know the route. All are good and invaluable. No ambitious DXer would be without them. Here is a list of some of the best: *The DX Bulletin* (306 Vernon Avenue, Vernon, CT 06066), *QRZ DX* (P.O. Box 4072, Richardson, TX 75080), *DX Report* (10 Fairington Crescent, St. Catharines, Ontario L2N 5W3, Canada), *DX News Sheet* (RSGB, Alma House, Cranborne Road, Potters Bar, Herts EN6 3JW, England), *Westlink* (28197 Robin Road, Saugus, CA 91350), *ARRL Letter* (225 Main Street, Newington, CT 06111, members only).

Usually sending an s.a.s.e. will bring a copy for study. The *DX Report*, while carrying a Canadian mailing address, is mailed in the U.S., speeding delivery. Actually, all of these bulletins are valuable, and most DXers end up with one, and sometimes more, to help them in their pursuits. *Westlink* and the *ARRL Letter* are relevant, general amateur publications with DX sections.

First International DX Symposium

Tom Taormina, K5RC, reports that the DX Symposium at the ARRL Convention in Houston in October of last year went off on a highly successful note. Twenty-nine speakers covered a day-long effort which included periods devoted to debates on Spotting Nets (OH2BH), Excessive Power (K5RC), Pre-Contest Scheduling (OH2BH), DX Lists (W5LLU), and DX-CC Deletion Criteria (K2SX). Going on concurrently with the above were Advisory Committee Reports for the DX and contest committees, reports of DXpeditions, and similar items. DXer or contest-er, it was a long but rewarding day.

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CIRCLE 135 ON READER SERVICE CARD

Greece on 160

Amateur operations in the 160 meter band were approved some months back with band limits set at 1830-1850 kHz.

Charles Jackson, SV0AA, says that he has found a couple of 160 openings to the east coast and that he will be active most mornings from 0330Z to 0430Z. He will also be active at other times, especially around the 2130Z period, as he is looking for either a VK or ZL to complete a 160 WAC. Since starting on 160 last September, SV0AA has racked up 37 DXCC countries, and by the time you read this he'll probably be closer to the 50 mark. He also notes that a number of SV calls are active, and considerable 160 action can be anticipated during this winter. SV0AA also plans to be active as single-band 160 during the season for DX Tests. QSL SV0AA to Charles Jackson, Box 722R, APO New York 09223. At the recent ARRL Board meeting held in Houston at the time of the convention, the board voted to petition the FCC for 160 RTTY privileges.

A Lot of Little DX Notes

With the 1984 Olympic Games coming this summer, the Suffering Sixes will be allowed to sign something else, they being able during July and August to substitute either 23 or 84 in lieu of the normal 6 in the prefix, such as WB84ZUC down in the c.w. areas. This is to mark the XXIII Olympiad in '84. The New Zealand Islands will have a change in their prefix after January 1st with Chatham being ZL7, Kermadec ZL8, Auckland/Campbell ZL9, and the Northern Cooks ZK3. VK9NS is aiming for a Kermadec operation in February with four operators going for eight days on all bands from 10 through 160. There is apparently a resident amateur on Kermadec, ZL3AFH, but he was not expected to be active until sometime early this year.

The YV0 Aves effort mentioned in the November '83 column still seems to be solid. Recently heard—well, a handful of months back—YV0AD was said to be Caribbean Slim.

DJ0UJ was hoping for an Albanian effort a few months back and everything appeared to be in order. Bahri got ready to go and waited for the license to arrive, and he waited and waited. Not giving up hope, he then decided to visit the homeland and find out what was holding up things. Being originally from Albania, DJ0UJ figured there would be no problem. The ZA Embassy in Vienna denied him a visa. He is still trying, however. Live in hope that Albania will be heard again. Martii Laine some months back delivered some amateur gear to the Sports Federation in Albania. One way or another, pluck and grit and longevity will triumph!

Bangladesh has indicated that they are issuing licenses again, but only to Bangladesh nationals. It took a lot of ef-



Getting a photo can be a bit more than a pleasant memory to a DXer. Last year Isao Nakashima, JH1RNZ, was in Bangladesh to help with cardiovascular studies at the Institute in Dacca. There was some political turmoil, and Isao snapped this photo and was immediately chased by the military and hauled off to jail. The JA Embassy in Dacca had to intervene to spring Isao loose. Isao was also in East Kiribati, West Kiribati, and Nauru and Christmas Islands last fall.

fort to get things moving again. Some idea of the problems in that part of the world may be derived from a recent news note that India intends to build a 1400 mile fence along the Bangladesh border.

TL8ER in the Central African Republic says he will be active until June, sometimes reported around 21005 kHz around 2030Z. QSL to F6GQK. Tom Wong, VE7BC, was in China a few months back aiming to put out some s.s.b. signals, but the effort was short-lived. Deliberate QRM brought a request from local authorities to take the station off the air. One overseas DX bulletin noted that it was reported that Tom had problems with European stations. CQ prefix will be used by Portuguese stations from January through March; and then CR from April 1st to June 30th.

Bob Walsh, WA8MOA, currently one of the operators at HZ1AB, says that they have some 60 countries on 160 and would like a few more. Although conditions are unpredictable, HZ1AB tries most Tuesdays and Thursdays from 0200Z at 1827 kHz. The CY0 prefix recently used by the VEs in their St. Paul Island effort has been designated as the enduring prefix for that island.

N6ADI has announced the QSL Management Services. Ski says that a lot of the problems with QSL Bureaus might be eliminated with some innovative, state-of-the-art card handling. Offering a full-service incoming and outgoing QSL service, N6ADI says you can get the whole story just by sending an s.a.s.e. to QSL Management Services, Box 379, Ojai, CA 93023.

Bahamas will be put on the air by a group out of Houston next month during the C.W. DX Test. The call being used will be N5RM/C6A, and the operators will in-

clude NS4M, K5IU, K5MM, and N5RM. QSLs will go to N5RM.

Going back to the September 1983 issue, the photo of San Hutson and Larry Brockman was taken by Jan Perkins, N6AW.

73, Cass, WA6AUD

QSL Information

First, we give you those with shining faces and boundless enthusiasm who wish to help their fellow DXers. Volunteers for duty as QSL Managers for DX stations are Charles Shanks, K7OVM, 1525 SW 208th, Aloha, OR 97006; and Joel Kupferberg, N9CPW, 5754 Meadwood Drive, Madison, WI 53711.

A6XJC to WB3CQN
N5RM/C6A to N5RM
W1BWS/CS2 to WA3HUP
CU6FSJ to CT1ARE
C30LAB to EA5AQX
CP1AT to WB0GFV (s.a.s.e.)
ED9IAL to EA9JV
EJ4ALE to El Bureau
EK10 to UK1AOZ
EL7M to SLIM
FP8HQ to NS4M
F08FB to WB6GFJ
F08DF to WB6GFJ
F08HI to WB6GFJ
G4JMB/CT3 to KB2XS
HH2A to WB2NEF
I2DMK/IA5 to I2MQP
JX6BA to LA7JO
KA48FT/HP1 to KA4BFT
KA4JRY/DV9 to KA4JRY
KD7P/KH2 to KD7Z
N9ALC/6Y5 to N9ALC
OE3GEA/584 to OE3GEA
OE3GBB/584 to OE3GBB
OJ8MA to OH0NA
OK8WCY to OK2KGV
PJ8I to N8II
SV8CTI to N4AXT
TE32CCC to TI2CCC
TJ1KR to W2PD
TU2JC to CBA
U3WKB to UK3WAA
VP2KBJ to K8EFS
VP2KBM to W4UY
VP2MIX to W0JN
V3DX to N6ADI
W9LNQ/6Y5 to W9LNQ
YT3T to YU1EIJ
ZF20HC to K4BWV
ZK1AR to WB6HGH
IZ9A to W7PHO
5T5JD to F08JD
7P8CT to DL2CI
C6ADV to Jan Weaver, N7YL,
2129 East Camero Ave., Las
Vegas, NV 89123
C21BD to P.O. Box 225, Re-
public of Nauru
F08JD to Jose Dumoulin, B.P.
85, Papeete, Tahiti
F08HO to North American only
to WB6GFJ, all others direct
Joseph Ina, 25 rue Yves Mar-
tin, Pirae, Tahiti
F08HL to North American only
to WB6GFJ, all others direct
Richard Ley, B.P. 5872, Pirae,
Tahiti
F08KB to Gabriel Lan San,
B.P. 926, Papeete, Tahiti
F08FO to P.O. Box 8053, Pa-
peete, Tahiti

J73BB to P.O. Box 389, Ro-
seau, Dominica
J73YB to P.O. Box 266, Ro-
seau, Dominica
J87BS to 3 Chesterfield Hill,
London W1, England
L2X to Jose Ahumada, LU2DX,
Box 3347, 1000 Buenos
Aires, Argentina
L8D/X to Grupo Argentino de
CW. Carlos Diehl 2025, 1854
Longchamps, BS AS Argen-
tina
LU3ZI to Grupo Argentino de
CW. Carlos Diehl 2025, 1854
Longchamps, BS AS Argen-
tina
PY1OL to P.O. Box 70048,
22422 Rio de Janeiro, Brazil
RX3WAC to UA4WBJ, P.O. Box
1300, Izhevsk, 426072, USSR
RX3WAS to UA4WBJ, P.O. Box
1300, Izhevsk, 426072, USSR
RX3WBJ to UA4WBJ, P.O. Box
1300, Izhevsk, 426072, USSR
RK4WAC to UA4WBJ, P.O. Box
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RK4WAB to UA4WBJ, P.O. Box
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RX4WCE to UA4WCE, P.O. Box
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2129 East Camero Ave., Las
Vegas, NV 89123
T3L to Jan Weaver, N7YL,
2129 East Camero Ave., Las
Vegas, NV 89123
W1DDV/C6A to Jan Weaver,
N7YL, 2129 East Camero
Ave., Las Vegas, NV 89123
V3A to Tim Heger, 14129 Lo-
cust, Olathe, KS 66062
ZY10L to P.O. Box 70048,
22422 Rio de Janeiro, Brazil
9V1UP to Bob Furzer, 12-01
Naga Ct., 355 Bukit Timah,
Singapore 1025
N2ATR/4X to P.O. Box 570, Je-
rusalem, Israel 91056
N9ALC/6Y5 to Robert Truhlar,
W9LNQ, 1701 West 101st
Street, Chicago, IL 60643

Tnx to W9LNQ for his listings and note that Bob has been doing some DX travel-
ing himself. HH2A says that if you have
long thirsted for an HH2A QSL card and
are still unfulfilled, he promises that
WB2NEF will produce. The Liberian Ra-
dio Amateur Assn. says that the call
EL7M was never issued, and EL2BA says
it is good ol' West Africa Slim.

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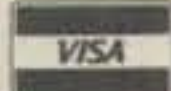
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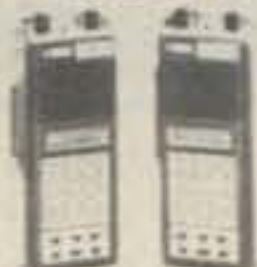
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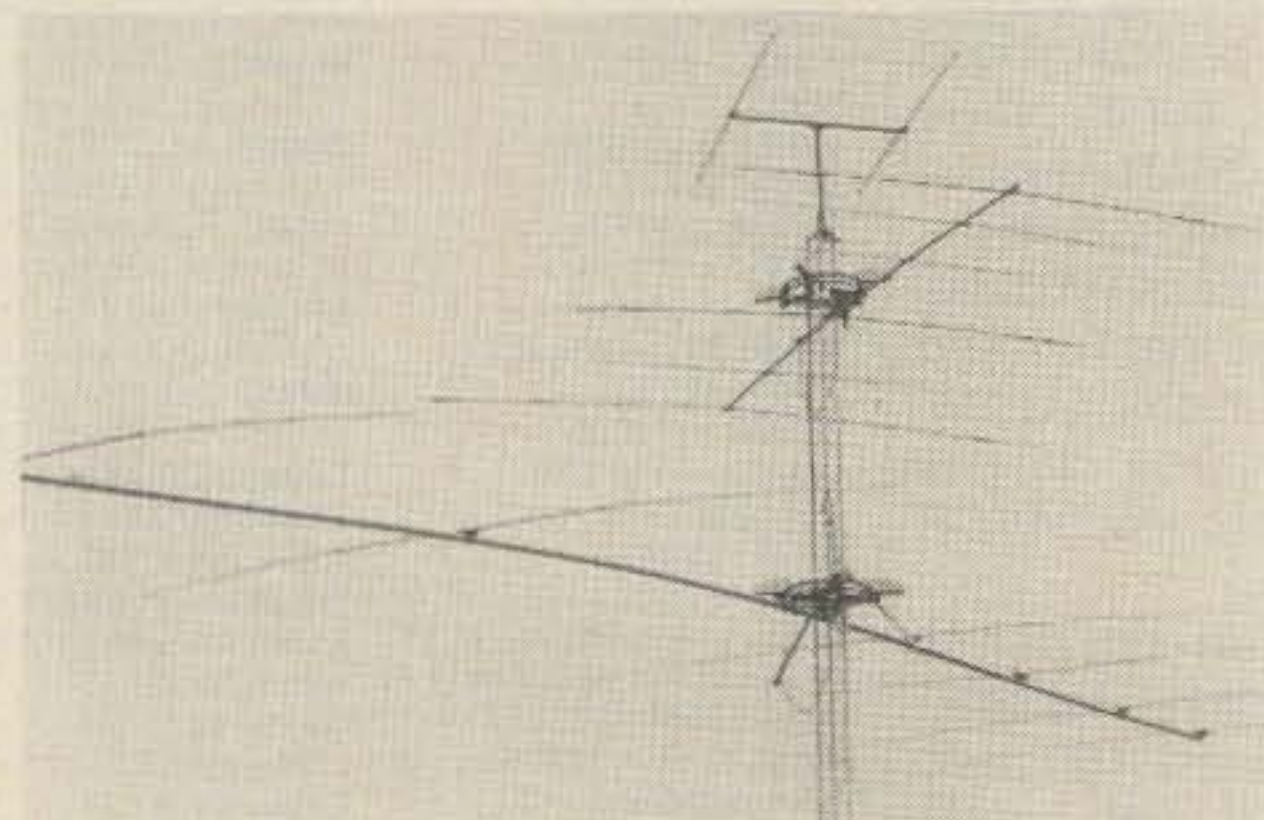
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Amp Supply, Daiwa, Mirage

CIRCLE 67 ON READER SERVICE CARD

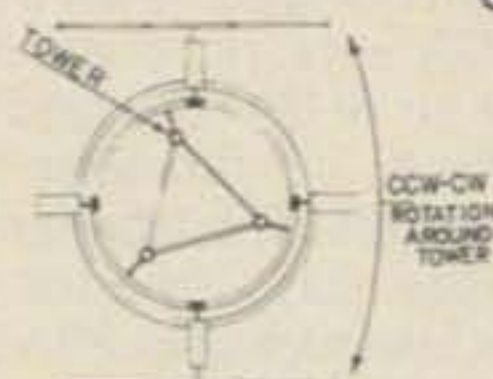


— Yes, that's a six element 20m monobander with a 57' boom.

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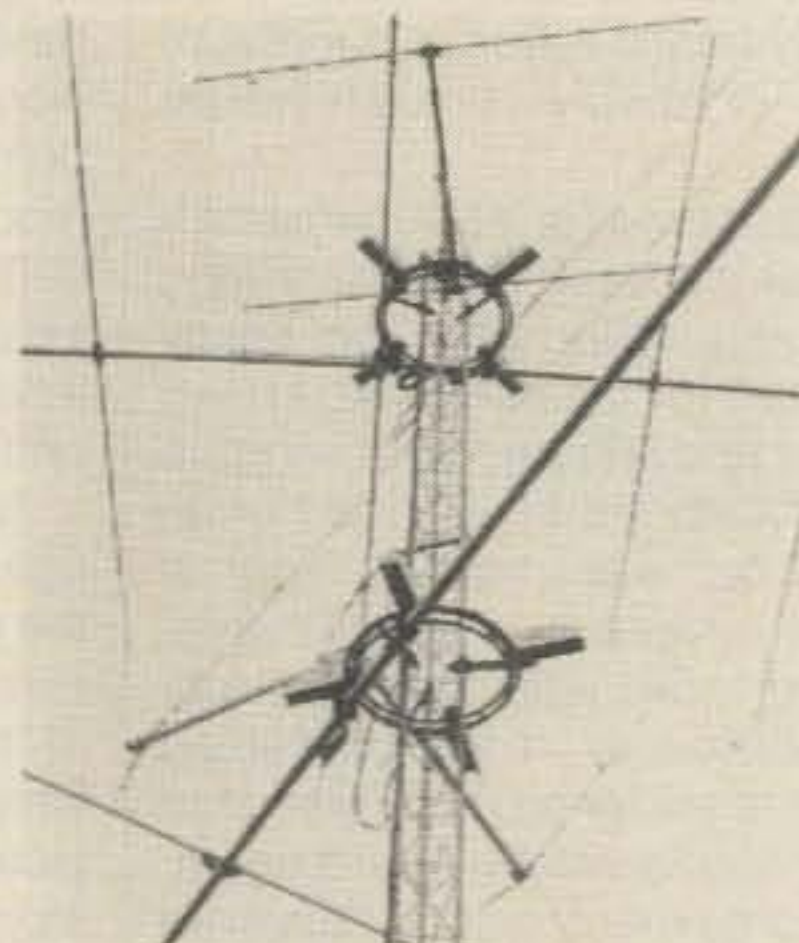
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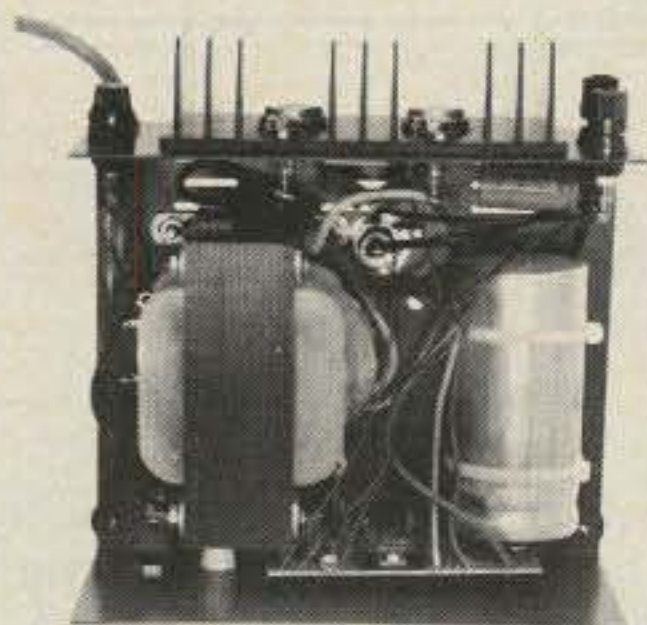


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MODEL RS-50M



MODEL VS-50M

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RS-4A	3	4	3 3/4 x 6 1/2 x 9	5
RS-7A	5	7	3 3/4 x 6 1/2 x 9	9
RS-10A	7.5	10	4 x 7 1/2 x 10 3/4	11
RS-12A	9	12	4 1/2 x 8 x 9	13
RS-20A	16	20	5 x 9 x 10 1/2	18
RS-35A	25	35	5 x 11 x 11	27
RS-50A	37	50	6 x 13 3/4 x 11	46

RS-M SERIES



MODEL RS-35M

- Switchable volt and Amp meter

MODEL	Continuous Duty (Amps)	ICS* (Amps)	Size (IN) H x W x D	Shipping Wt (lbs)
RS-12M	9	12	4 1/2 x 8 x 9	13
RS-20M	16	20	5 x 9 x 10 1/2	18
RS-35M	25	35	5 x 11 x 11	27
RS-50M	37	50	6 x 13 3/4 x 11	46

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MODEL VS-20M

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VS-35M	25 15 7	35	5 x 11 x 11	29
VS-50M	37 22 10	50	6 x 13 3/4 x 11	46

RS-S SERIES



MODEL RS-12S

- Built in speaker

MODEL	Continuous Duty (Amps)	ICS* Amps	Size (IN) H x W x D	Shipping Wt (lbs)
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RS-20S	16	20	5 x 9 x 10 1/2	18



MODEL RS-7B

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RS-7B	5	7	4 x 7 1/2 x 10 3/4	9
RS-10A	7.5	10	4 x 7 1/2 x 10 3/4	11

*ICS—Intermittent Communication Service (50% Duty Cycle 5 min. on 5 min. off)

CIRCLE 80 ON READER SERVICE CARD

THE INS AND OUTS OF THE WASHINGTON SCENE

Amateur Radio May Take Some "Hits" On WARC Implementation Docket

According to *The ARRL Letter* (for members only), "Much of the 'news' about Docket 80-739 [the WARC implementation docket] involving amateur radio is likely to be bad." In question are a number of items, including the status of the top half of the 160 meter band, sharing in the 220 MHz band (the military may vacate this band), the status of the 420-430 MHz band along the Canadian border, and implementation of an amateur band at 902-928 MHz. In addition, we will probably lose the 1215-1240 MHz segment, with the status of our band at 2310-2390 MHz in question.

Low-Power Television: The Other Shoe Falls

The creation of a low-power broadcasting service by the Commission in 1980 sent shivers throughout the Land Mobile and Amateur Radio services. These stations, which will use power levels considerably lower than conventional television stations, will be located in populated areas to serve the needs of specific communities. For any given station, coverage would include the area within a 10 or 15 mile radius. Because the power levels used will be low, it is expected that even in the designated area of service, picture quality might be degraded for reasons due, among other things, to natural and manmade obstructions. Further, it would be expected that viewers outside the area of service (fringe area) will "tune in" as a matter of interest. Thus, television receivers tuned to a low-power television signal will be exceptionally susceptible to overload. The result: alleged television interference for which land mobile and amateur operators will be blamed!

So popular was the idea of running a low-power television station that the FCC received 12,000 applications for roughly 4,000 available channels. Licenses for 360 stations have already been awarded in areas where there was no competition for a license. But recently, the Commission began efforts to break the license logjam. A lottery was held in Washington, DC, during September 1982 to select and award 23 licenses for low-power television stations in rural areas. Nine more

such "rural licensing lotteries" will be held shortly, after which licenses for medium-size markets and large cities will be awarded.

In creating the low-power television service, the intent of the Commission was to give nonprofit, religious, and minority broadcasters access to the spectrum. While laudable, this action took little recognition of the fact that today's television receivers are generally not built to operate in the presence of transmitters such as those used in the Land Mobile and Amateur services. Thus, the Commission should brace itself for a flood of TVI complaints that neither it nor the radio services involved will be able to address effectively.

Commission Rumored To Not Pursue Hilderbrand Case

According to *WESTLINK Report*, The FCC will probably never act on the joint Private Radio Bureau (PRB) and ARRL request filed in the Hilderbrand (N6BHU) obscenity case because the Commissioners fear a protracted court battle that could tie their hands in other cases involving violation of FCC Rules Part 97.119." However, Ray Kowalski, Chief, Special Services Division, PRB, told your editor that he has no indication there is any truth to this rumor.

Hilderbrand's license had been revoked by an FCC Administrative Law Judge after he was found to have violated prohibitions on the transmission of indecent and profane language. The action was appealed to an FCC Review Board, which found that the standards applied by the ALJ were unconstitutional. As a consequence, Hilderbrand's license was reinstated.

The latter action brought an angry reply from the PRB, the League, and Senator Goldwater, all of whom sought to have the Review Board's decision overturned. Now, according to *WESTLINK Report*, the Commissioners may be reluctant to become involved in a constitutional matter, and so the matter may be dropped.

Unfortunately, waiting in the wings are several former amateurs whose licenses have been revoked and who claim they have a "constitutional right" to use filthy language on the air. These former hams are apparently taking action to have their

revocation orders voided and their licenses restored. At the same time, some are bringing pressure to bear so as to force those who would foul the airwaves to take their garbage elsewhere! (See next item.)

Amateur Petitions FCC to Limit Eligibility for Operator Licenses of Applicants Whose Licenses Have Been Revoked or Suspended

Jon J. Gallo, KB6WT, has petitioned the FCC to establish a procedure to identify and limit the eligibility for an amateur license of applicants whose prior operator licenses have been revoked or suspended by the Commission for a violation of its Rules. In his petition, Gallo notes that revocation of an amateur license is one of the more severe sanctions available to the Commission in regulating the Amateur service. Further, he argued that in some cases repeated and willful violations give rise to the reasonable inference that relicensing of the individual involved would not be in the public interest, convenience, or necessity.

Once it has identified an applicant whose license was revoked or suspended, Gallo suggests that the FCC exercise one or both of the following alternatives:

1. Designate the application as automatically requiring a hearing, with the applicant required to show cause as to why it is in the public interest, convenience, or necessity that a new license be issued. Complainants would be required to show cause as to why a new license should not be issued.

2. Issue only a Probationary Special Temporary Authority (PSTA) of limited duration, perhaps not exceeding one year. This PSTA could be revoked on satisfactory proof of continued willful violations. If the PSTA is revoked, the applicant would not be eligible for relicensing either permanently or for a fixed period of time (e.g., 5 or 10 years).

At this writing, the Commission has yet to indicate if it will act on this petition.

Volunteer Examination Program

As reported last month, the Commission, on 22 September 1983, adopted a Report and Order concerning the use of volunteer examiners for amateur exams (Docket No. 83-27). In general, the Report

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and Order established regional Volunteer Examination Coordinators (versus a single, national coordinator); in all, therefore, at least 13 VECs will be required to cover the 10 U.S. call areas plus Alaska, the Caribbean, and the Pacific. Further, the FCC erected a so-called "Chinese Wall," legal mumbo-jumbo for procedures to isolate the people who administer the examination program from those who prepare the study material.

Other points covered in the Report and Order include provisions for (1) retesting anyone who received a license based on an exam administered by a VEC; (2) instant upgrading; (3) prohibiting a person whose license was revoked from ever serving as a volunteer examiner; (4) deleting the "team chief" concept; and (5) requiring applicants to register for exams 30 days in advance, and requiring the volunteer examination team to notify the FCC as to when the examination will take place.

The full Report and Order was not available as this was written. However, the material above is thought to well represent the Commission's action.

Goldwater Supports Reimbursing Volunteer Examiners

By the time this is read, Senator Barry Goldwater may have introduced legislation aimed at authorizing VECs to recover out-of-pocket expenses incurred in the administration of amateur exams. The legislation, requested by the ARRL, would, if enacted, clear the way for the League to participate in the Volunteer Examination Program (readers will recall that the League notified the FCC that it would not participate if examiners could not recover their out-of-pocket costs). Current thinking calls for a expense ceiling of \$4.00 per applicant, with increases not to exceed 50¢ in any one year. A draft bill was being reviewed as we go to press, and according to sources on the Hill, the language still requires clarification.

Commission To Implement 10-Year Amateur Licenses

In late 1983, the Commission issued a Report and Order adopting 10-year license terms for amateur operator and station licenses. In addition, the grace period for both types of licenses was changed to two years.

Previously, amateur licenses were valid for a period of five years, with the grace period for the operator's license set at five years and the grace period for the station license set at one year. The change actually makes an amateur's operator and station licenses viable for 12 years (however, operation is prohibited after the 10-year term until such time that the licenses are renewed).

The new license term will take effect on your next renewal, although John Johnston, Chief, Personal Radio Branch, Special Services Division, PRB, noted

that it may be early 1984 before the Commission's computer is reprogrammed to handle the change.

Commission Actively Pursues Violators in San Diego, CA, Area

According to Jeffrey Young, Enforcement Division, Field Operations Bureau, FCC, numerous complaints of intentional interference to the operations of a repeater mounted on Mt. Otay brought swift action against the violators by the FCC, the ARRL, a southern California congressman, and local amateurs. The latter are participating in the Commission's enforcement activities under the provisions of the so-called "Goldwater Bill" which was signed into law last year. It is highly likely that by the time this is read, the Commission will have imposed sanctions against the violators who are jamming the repeater.

Foosaner Expresses Concern Over Amateur Preoccupation with Callsigns

While he is impressed with, enthusiastic about, and extremely supportive of the Amateur service and its operators, Robert Foosaner, Chief, Private Radio Bureau, FCC, is very concerned about our preoccupation with callsigns. According to Foosaner, "the demands put upon the PRB, the Commission, and the Congress to satisfy individual requests requires that I spend less time on matters of greater importance to the amateur community in general." Foosaner went on to state "that amateurs will simply have to accept random callsign assignments."

Other than the problems involving callsigns, however, Foosaner commented that one of his true pleasures as Chief of the PRB is dealing with members of our service.

New Handbook on Emergency Communications Debuts

Of all amateur activities, the capability to provide emergency and disaster communications is foremost in most people's minds. But being prepared to provide these services just doesn't happen... it takes knowledge, training, and experience. And to help you prepare for emergency operations, F. Dale Williams, K3PUR, has written a new book: *Emergency Communications, An Organizational and Operational Handbook*. The handbook covers a wide variety of subjects, ranging from a description of the public service communications provided by different agencies to the communications techniques used, and from a description of the equipment you'll need to examples of emergency exercises.

Emergency Communications is available from FDW Arts, P.O. Box 2540, Falls Church, VA 22042 for \$9.95 plus \$1.50 postage and handling (Virginia residents add 4% sales tax).

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CIRCLE 165 ON READER SERVICE CARD

THE SCIENCE OF PREDICTING RADIO CONDITIONS

The Royal Observatory of Belgium, the world's official keeper of sunspot records, reports a monthly mean sunspot number of 50.9 for September 1983. This results in a smoothed sunspot number of 86 centered on March 1983. This represents a decline in the present cycle of four points in a month.

Cycle 21, the present sunspot cycle, is expected to continue to decline steadily throughout 1984. The new year should begin with a smoothed sunspot number of 68 and end with a number of approximately 48. This level of solar activity is considered to be *moderate*, and 1984 should be a relatively good year for h.f. propagation conditions, although considerably below the high activity levels of the past five years.

Table I shows the progress of Cycle 21 on a month-to-month basis since it began in June 1976, as well as a prediction for the level expected during 1984. Cycle 21 is expected to reach its minimum value sometime during 1987.

Compared to the past five years of high solar activity, expect the following conditions during 1984 for each of the amateur bands between 6 and 160 meters.

6 meters: The present cycle has now declined to a point where little, if any, F2-layer propagation will be possible during 1984. Short-skip sporadic-E openings should be as numerous as during previous years. Look for openings up to approximately 1300 miles, but not many beyond this range. Gone are the long intercontinental DX openings until the high period of the next cycle!

10 meters: Fewer DX openings on this band are expected during 1984, but it should continue to be a fairly good band to most areas of the world during the daylight hours of the equinox and winter months, with north-south DX openings possible during the summer months as well. The band will open on fewer days during 1984 and for shorter periods of time, but it will remain very alive for DX.

15 meters: This is expected to be the optimum band for DX during the daytime hours of 1984, particularly during the equinox and winter months. The band will open for somewhat shorter periods of time, but otherwise it should not be too much different from the conditions observed during 1983. Expect good world-wide DX on 15 meters during 1984.

20 meters: Somewhat fewer long DX openings are expected, but otherwise conditions should not be much different

LAST MINUTE FORECAST

Day-to-Day Conditions Expected for January 1984

Propagation Index	Expected Signal Quality			
	(4)	(3)	(2)	(1)
Above Normal: 4, 6, 15, 27	A	A	B	C
High Normal: 1, 3, 5, 16, 22, 26, 28, 30-31	A	B	C	C-D
Low Normal: 2, 7-8, 10-11, 14, 17, 21, 23, 29	A-B	B-C	C-D	D-E
Below Normal: 9, 12-13, 18, 20, 24-25	B-C	C-D	D-E	E
Disturbed: 19	C-E	D-E	E	E

Where expected signal quality is: A—Excellent opening, exceptionally strong, steady signals greater than S9.

B—Good opening, moderately strong signals varying between S6 and S9, with little fading or noise.

C—Fair opening, signals between moderately strong and weak, varying between S3 and S6, with some fading and noise.

D—Poor opening, with weak signals varying between S1 and S3, and with considerable fading and noise.

E—No opening expected.

HOW TO USE THIS FORECAST

1. Find propagation index associated with particular band opening from Propagation Charts appearing on the following pages.
2. With the propagation index, use the above table to find the expected signal quality associated with the band opening for any day of the month. For example, an opening shown in the charts with a propagation index of 3 will be good (B) on January 1st, good-to-fair (B-C) on the 2nd, good (B) on the 3rd, excellent (A) on the 4th, etc.

from previous years during the hours of daylight, with good world-wide DX possible throughout the year. Peak periods are expected for an hour or two after local sunrise and again during the late afternoon hours. During periods of high solar activity, 20 meters is often also an excellent band for DX propagation during much of the darkness period. This will be less so during 1984. While many good DX openings are expected during the nighttime period of the equinox and summer months, these may be noticeably less than during previous years. Only occa-

sional DX openings are expected on 20 meters during the nighttime hours of the winter months.

40, 80, and 160 meters: These will remain basically nighttime DX bands with little change from the conditions noted during 1983. World-wide DX should be possible on both 40 and 80 meters during all seasons. Some DX openings should also be possible on 160 meters during the nighttime periods of the equinox and winter months.

January Conditions

Typical wintertime h.f. propagation conditions are expected to continue through January. Maximum usable frequencies are expected to remain high during the daylight hours, dropping to seasonally low values during the hours of darkness. Atmospheric noise levels (static) are expected to be at their lowest values of the year in the northern hemisphere, and signal levels are predicted to be exceptionally strong during many band openings.

Although some good 10 meter openings are forecast to many areas of the world, 15 meters should be the best band for DX propagation conditions during the daylight hours. Good openings to almost all areas of the world are forecast during a window extending from shortly after sunrise through sundown. Openings generally will follow the sun on both 10 and 15 meters, first towards Europe and the east before noon, then towards the south during the early afternoon hours, peaking last towards the west during the later afternoon hours.

Good openings to most areas of the world are also forecast for 20 meters from dawn through the evening hours, with conditions peaking shortly after sunrise and again during the late afternoon hours.

Good openings to most areas of the

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
1976						12	13	14	14	13	14	15
1977	17	18	20	22	24	26	29	33	39	46	52	57
1978	61	65	70	77	83	89	97	104	108	111	113	118
1979	124	131	137	141	147	153	155	155	156	158	162	165*
1980	164	163	161	159	156	155	153	150	150	150	148	143
1981	140	142	143	143	143	142	140	141	143	142	139	138
1982	137	133	129	124	120	117	115	109	101	96	95	95
1983	93	90	86	84	82	80	78	76	75	74	72	70
1984	68	66	64	62	61	61	60	58	56	52	50	48

*Peak of Cycle 21.

Values from July 1982 are provisional, subject to slight change.

(ital) Predicted for remainder of 1983 and 1984.

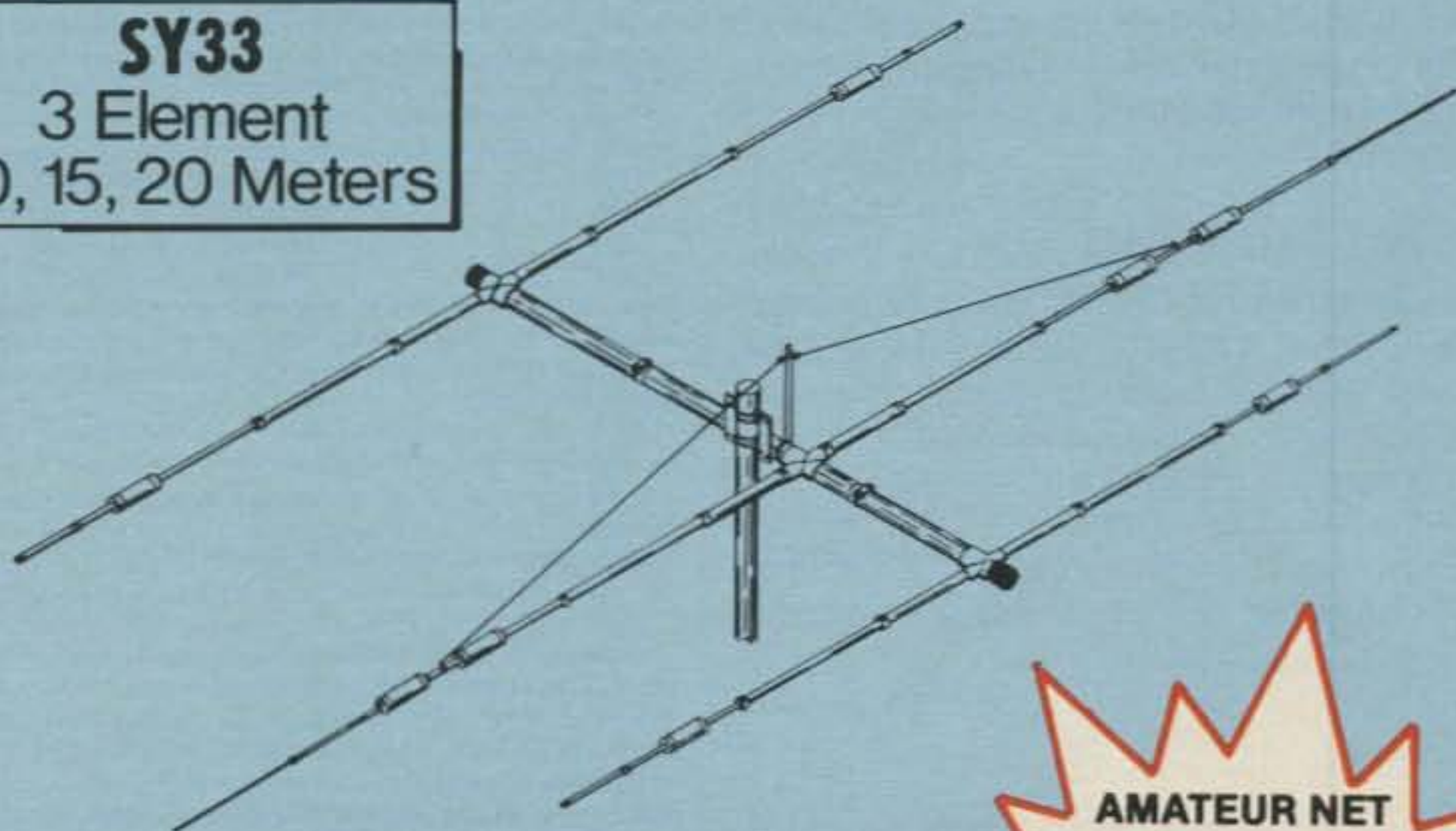
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Table I—Progress of sunspot Cycle 21 smoothed sunspot numbers.

WILSON ANTENNAS ARE BACK...

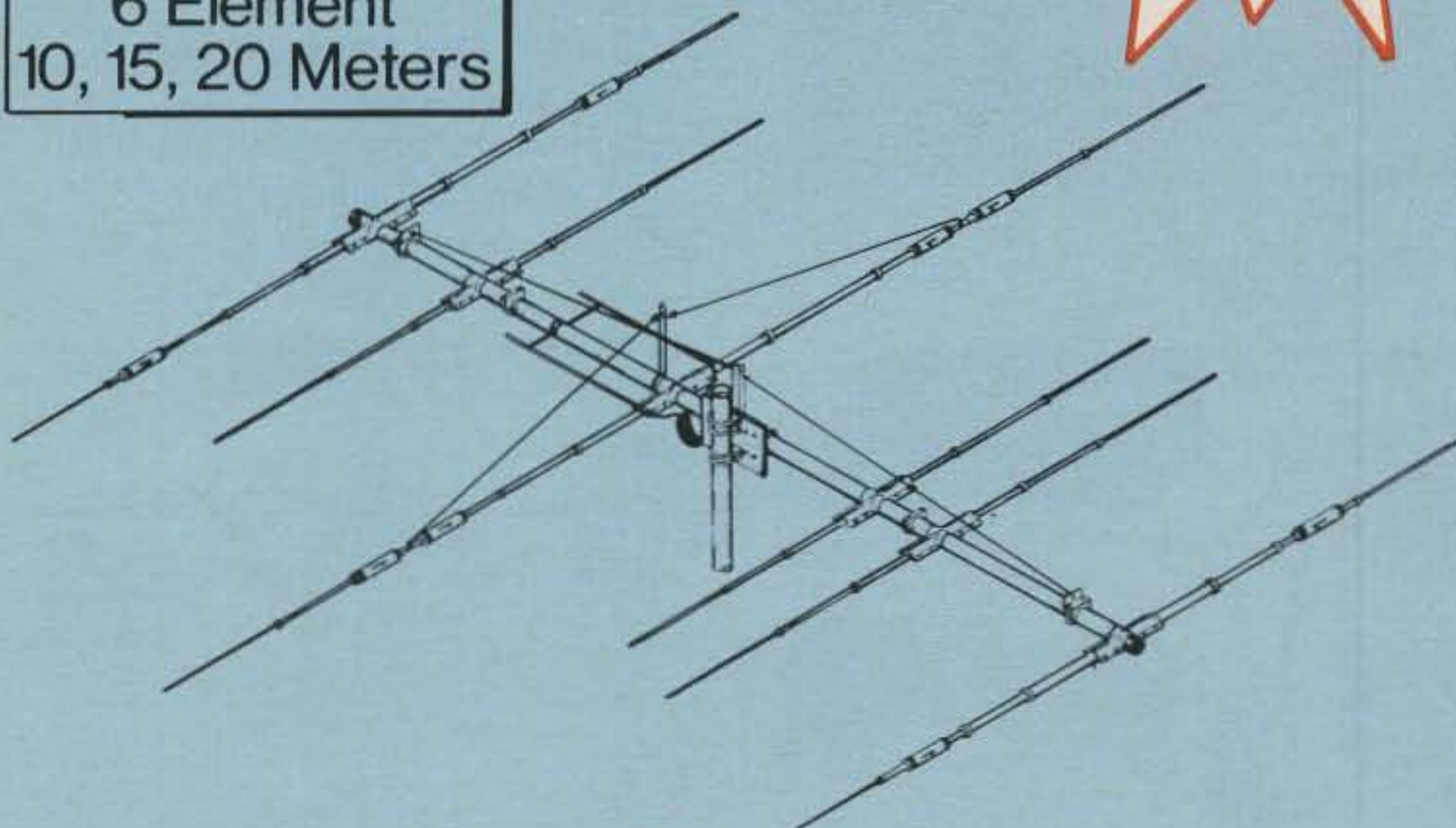
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SY33 3 Element 10, 15, 20 Meters



Band MHz:	14-21-28	Longest element:	27'4"
Maximum power input:	legal limit	Turning radius:	15'9"
Gain (dBd):	up to 8 dB	Maximum mast diameter:	2" O.D.
VSWR at resonance:	1.3:1	Surface area:	5.7 sq. ft.
Impedance:	50 ohms	Wind loading at 80 mph:	114 lbs.
F/B ratio:	up to 20 dB	Assembled weight (approx.):	37 lbs.
Boom (O.D. x length):	2" x 14'4"	Shipping weight (approx.):	42 lbs.
No. elements:	3	Direct 52 ohm feed	no balun required
		Maximum wind survival:	100 mph

SY36 6 Element 10, 15, 20 Meters



Band MHz:	14-21-28	Longest Element:	29'6 1/2"
Maximum power input:	legal limit	Turning radius:	19'1"
Gain (dBd):	up to 9 dB	Maximum mast diameter:	2" O.D.
VSWR at resonance:	1.1:1	Surface area:	8.6 sq. ft.
Impedance:	50 ohms	Wind loading at 80 mph:	215 lbs.
F/B ratio:	up to 20 dB	Assembled weight (approx.):	53 lbs.
Boom (O.D. x length):	2" x 24'2 1/2"	Shipping weight (approx.):	62 lbs.
No. elements:	6	Maximum wind survival:	100 mph

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world are also forecast for 40 meters, beginning in the late afternoon hours, and continuing through the hours of darkness and until shortly after sunrise. Eighty meter DX openings to many areas of the world are also forecast for the nighttime period. Some 160 meter DX openings should also be possible during the hours of darkness and the sunrise period. DX openings on the 40, 80, and 160 meter bands tend to follow the day-night terminator, with signals peaking when it is sunrise on the most eastern end of a circuit.

V.H.F. Ionospheric Openings

Some meteor-scatter-type v.h.f. openings may take place during the first week of January, when the *Quadrantids* meteor shower is expected to occur. The *Quadrantids* is generally a moderately active shower.

Some sporadic-E propagation and auroral-scatter openings may take place during periods of radio storminess. Check the Last-Minute Forecast to see what days during January are expected

to be Below Normal or Disturbed. These are the days when such openings are most likely on the v.h.f. bands.

January should be a poor month for trans-equatorial scatter propagation on 6 meters, but an occasional opening may be possible between approximately 7 and 10 p.m. local time. An occasional 6 meter F2-layer DX opening may be possible towards South America from about an hour or two before to about an hour or two after noon. Openings are most likely to occur when conditions are High or Above Normal.

Short-Skip Charts

This month's column contains a Short-Skip Chart for use in the continental United States for distances between 50 and 2300 miles. Special propagation charts centered on Hawaii and Alaska are also included. The charts are valid through February 1984. See last month's column for detailed DX propagation charts for use during January.

73, George, W3ASK

HOW TO USE THE SHORT-SKIP CHARTS

1. In the Short-Skip Chart, the predicted times of openings can be found under the appropriate distance column of a particular Meter band (10 through 160 Meters) as shown in the left hand column of the Chart. For the Alaska and Hawaii Charts the predicted times of openings are found under the appropriate Meter band column (10 through 80 Meters) for a particular geographical region of the continental USA as shown in the left hand column of the Charts. An * indicates the best time to listen for 80 meter openings.

2. The propagation index is the number that appears in () after the time of each predicted opening. On the Short-Skip Chart, where two numerals are shown within a single set of parenthesis, the first applies to the shorter distance for which the forecast is made, and the second to the greater distance. The index indicates the number of days during the month on which the opening is expected to take place, as follows:

- (4) Opening should occur on more than 22 days
- (3) " " " between 14 and 22 days
- (2) " " " between 7 and 13 days
- (1) " " " on less than 7 days

Refer to the "Last Minute Forecast" at the beginning of this column for the actual dates on which an opening with a specific propagation index is likely to occur, and the signal quality that can be expected.

3. Times shown in the Charts are in the 24-hour system, where 00 is midnight; 12 is noon; 01 is 1 A.M.; 13 is 1 P.M., etc. On the Short-Skip Chart appropriate standard time is used at the path midpoint. For example on a circuit between Maine and Florida, the time shown would be EST, on a circuit between N.Y. and Texas, the time at the midpoint would be CST, etc. Times shown in the Hawaii Chart are in HST. To convert to standard time in other USA time zones add 2 hours in the PST zone; 4 hours in the MST zone; 3 hours in the CST zone, and 5 hours in the EST zone. Add 10 hours to convert from HST to GMT. For example, when it is 12 noon in Honolulu, it is 14 or 2 P.M. in Los Angeles; 17 or 5 P.M. in Washington, D.C.; and 22 GMT. Time shown in the Alaska Chart is given in GMT. To convert to standard time in other areas of the USA subtract 8 hours in the PST zone; 7 hours in the MST zone; 6 hours in the CST zone and 5 hours in the EST zone. For example, at 20 GMT it is 15 or 3 P.M. in N.Y.C.

4. The Short-Skip Chart is based upon a transmitted power of 75 watts c.w. or 300 watts p.e.p. on sideband; the Alaska and Hawaii Charts are based upon a transmitter power of 250 watts c.w. or 1 kw p.e.p. on sideband. A dipole antenna a quarter-wavelength above ground is assumed for 160 and 80 meters, a half-wave above ground on 40 and 20 meters, and a wavelength above ground on 15 and 10 meters. For each 10 db gain above these reference levels, the propagation index will increase by one level for each 10db loss, it will lower by one level.

5. Propagation data contained in the Charts has been prepared from basic data published by the Institute for Telecommunication Sciences of the U.S. Dept. of Commerce, Boulder, Colorado, 80302.

CQ Short-Skip Propagation Chart January & February 1984 Local Standard Time at Path Mid-Point (24-Hour Time System)

Band (Meters)	Distance From Transmitter (Miles)			
	50-250	250-750	750-1300	1300-2300
10	Nll	Nll	07-09 (0-1) 09-15 (0-2) 15-17 (0-1)	07-09 (1) 09-11 (2) 11-15 (2-3) 15-17 (1-2) 17-19 (0-1)
15	Nll	08-16 (0-2)	07-08 (0-1) 08-09 (2) 09-11 (2-3) 11-16 (2-4) 16-18 (0-2) 18-20 (0-1)	07-08 (1-2) 08-09 (2) 09-11 (3) 11-16 (4) 16-18 (2-3) 18-20 (1)
20	11-15 (0-1)	08-09 (0-2) 09-11 (0-3) 11-15 (1-4) 15-17 (0-2) 17-00 (0-1)	08-09 (2-3) 09-11 (3-4) 11-15 (4) 15-17 (2-4) 17-18 (1-4) 18-21 (1-2) 21-00 (1) 00-08 (0-1)	08-09 (3-4) 09-10 (4) 10-14 (4-3) 14-18 (4) 18-21 (2-3) 21-00 (1-2) 00-07 (1) 07-08 (1-2)
40	07-08 (0-1) 08-09 (1-3) 09-10 (2-4) 10-16 (4) 16-17 (3-4) 17-19 (1-3) 19-20 (1-2) 20-00 (0-1)	02-07 (0-1) 07-08 (1-2) 08-09 (3) 09-11 (4-3) 11-15 (4-2) 15-17 (4) 17-19 (3-4) 19-20 (2-3) 20-21 (1-2) 21-00 (1-2) 00-02 (0-2)	07-08 (2) 08-11 (3-1) 11-15 (2-1) 15-17 (4-2) 17-19 (4) 19-20 (3-4) 20-23 (2-4) 23-02 (2-3) 02-04 (1-3) 04-07 (1-2)	07-08 (2-1) 08-15 (1-0) 15-17 (2) 17-19 (4-3) 19-23 (4) 23-02 (3-4) 02-04 (3) 04-07 (2)



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160	09-17 (1-0) 17-19 (3-2) 19-05 (4) 05-07 (3-2) 07-09 (2-1)	17-19 (2-1) 19-21 (4-2) 21-04 (4) 04-05 (4-3) 05-07 (2-1) 07-09 (1-0)	17-18 (1-0) 18-19 (1) 19-21 (2-1) 21-04 (4-3) 04-05 (3-2) 05-06 (1) 06-08 (1-0)	18-20 (1-0) 20-21 (1) 21-01 (3-2) 01-03 (3) 03-04 (3-2) 04-05 (2-1) 05-07 (1-0)

ALASKA January & February, 1984 Openings Given In GMT#

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	18-20 (1) 20-22 (2) 22-23 (1)	17-19 (1) 19-20 (2) 20-22 (3) 22-23 (2) 23-01 (1)	11-16 (1) 16-18 (2) 18-21 (1) 21-22 (2) 22-00 (3) 00-01 (2) 01-03 (1)	04-13 (1) 07-12 (1)*
Central USA	18-20 (1) 20-23 (2) 23-01 (1)	16-19 (1) 19-21 (2) 21-00 (3) 00-01 (2) 01-03 (1)	11-17 (1) 17-19 (2) 19-21 (1) 21-23 (2) 23-01 (3) 01-02 (2) 02-04 (1)	03-14 (1) 07-12 (1)*
Western USA	18-21 (1) 21-00 (2) 00-02 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-04 (1)	11-17 (1) 17-20 (2) 20-21 (3) 21-00 (4) 00-01 (3) 01-03 (2) 03-05 (1)	04-05 (1) 05-12 (2) 12-15 (1) 15-16 (2) 16-17 (1) 05-12 (1)* 12-15 (2)* 15-17 (1)*

HAWAII January & February, 1984 Openings Given In Hawaiian Standard Time

TO:	10 Meters	15 Meters	20 Meters	40/80 Meters
Eastern USA	07-08 (1) 08-11 (2) 11-13 (3) 13-14 (2) 14-15 (1)	06-07 (1) 07-10 (2) 10-12 (3) 12-14 (4) 14-15 (3) 15-16 (2) 16-17 (1)	12-15 (2) 15-17 (3) 17-20 (2) 20-02 (1) 02-04 (2) 04-12 (1)	17-19 (1) 19-21 (2) 21-00 (3) 00-03 (2) 03-04 (1) 19-21 (1)* 21-01 (2)* 01-03 (1)*
Central USA	07-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-13 (3) 13-15 (4) 15-16 (3) 16-17 (2) 17-18 (1)	13-14 (3) 14-17 (4) 17-19 (3) 19-21 (2) 21-04 (1) 04-06 (2) 06-08 (3) 08-13 (2)	17-19 (1) 19-20 (2) 20-03 (3) 03-04 (2) 04-06 (1) 19-21 (1)* 21-03 (2)* 03-05 (1)*
Western USA	06-08 (1) 08-10 (2) 10-14 (3) 14-16 (2) 16-17 (1)	06-07 (1) 07-08 (2) 08-09 (3) 09-15 (4) 15-16 (3) 16-18 (2) 18-19 (1)	06-07 (2) 07-10 (4) 10-14 (3) 14-16 (4) 16-18 (3) 18-22 (2) 22-06 (1)	16-18 (1) 18-19 (2) 19-22 (4) 22-02 (3) 02-04 (2) 04-09 (1) 19-20 (1)* 20-22 (2)* 22-04 (3)* 04-05 (2)* 05-07 (1)*

#See explanation in "How To Use Short-Skip Charts" in the box at the beginning of this column.

*Indicates best time to listen for 80 Meter openings. Openings on 160 Meters are also likely to occur during those times when 80 Meter openings are shown with a forecast rating of (2), or higher.

Note: The Alaska and Hawaii Propagation Charts are intended for distance greater than 1300 miles. For openings over shorter distances, use the preceding Short-Skip Propagation Chart.

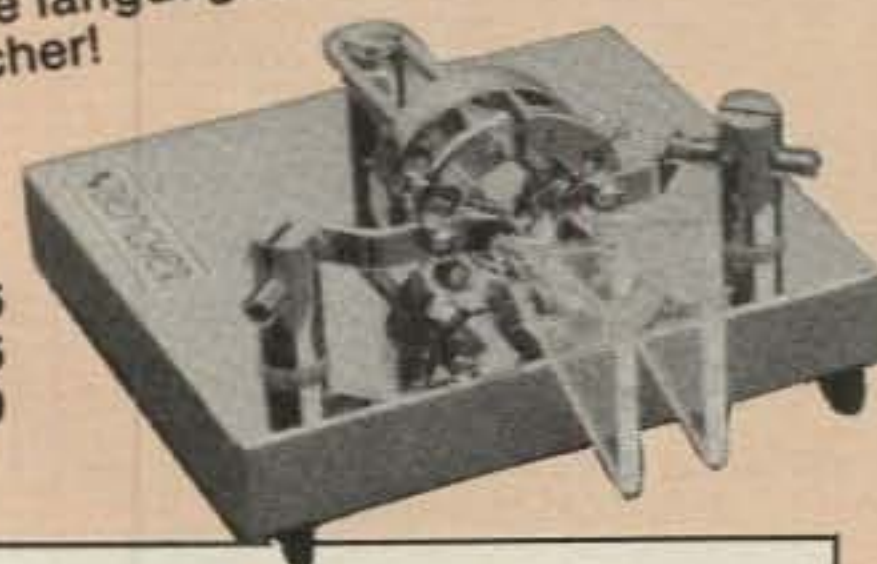
Check for 6 Meter openings at times when the 10 Meter forecast rating is shown as (4).

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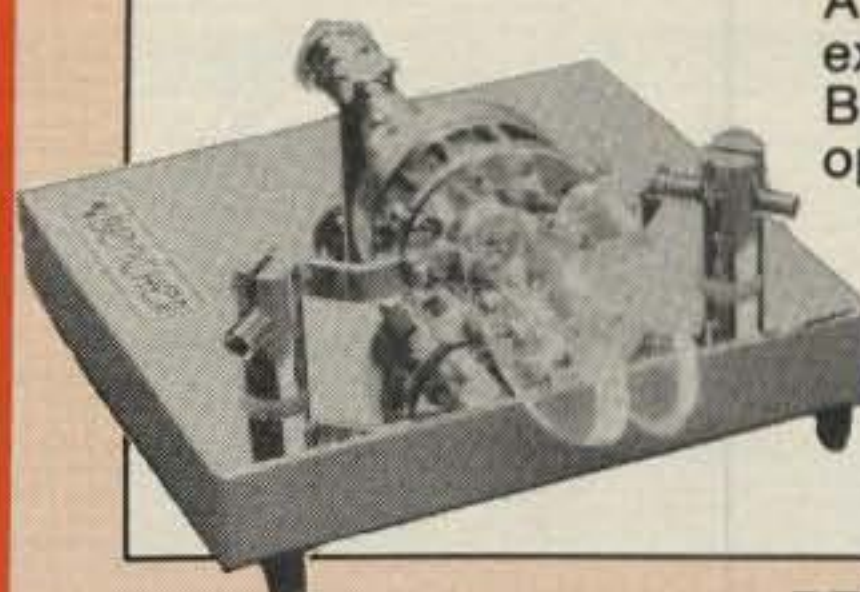
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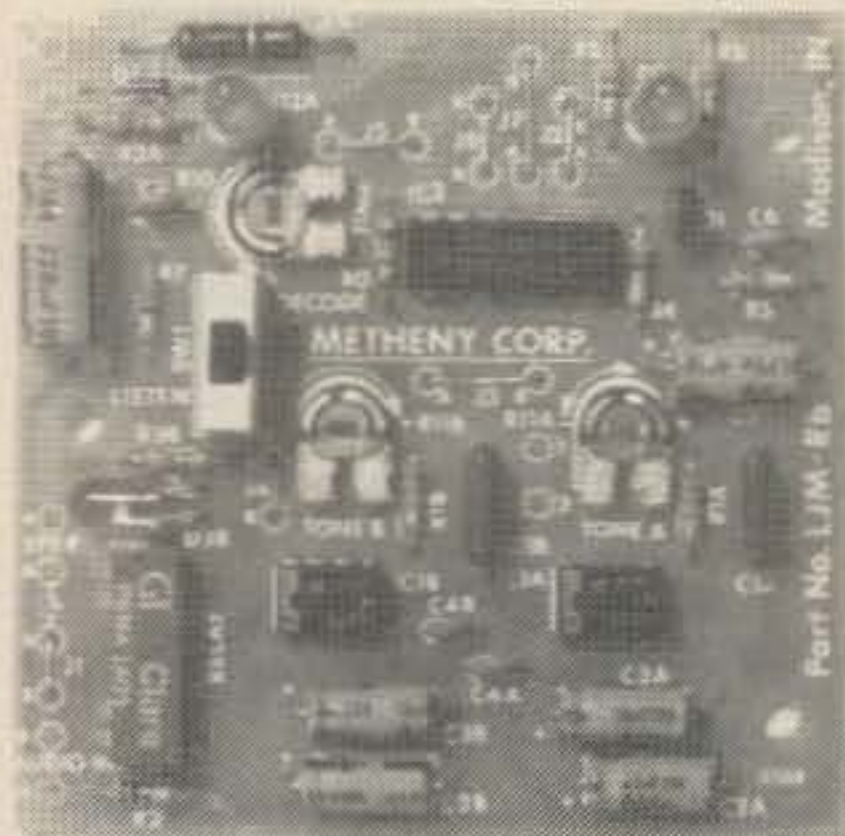
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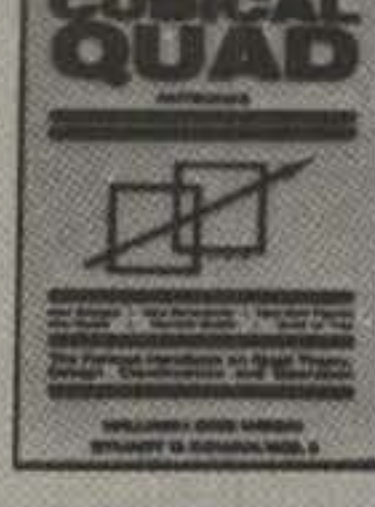
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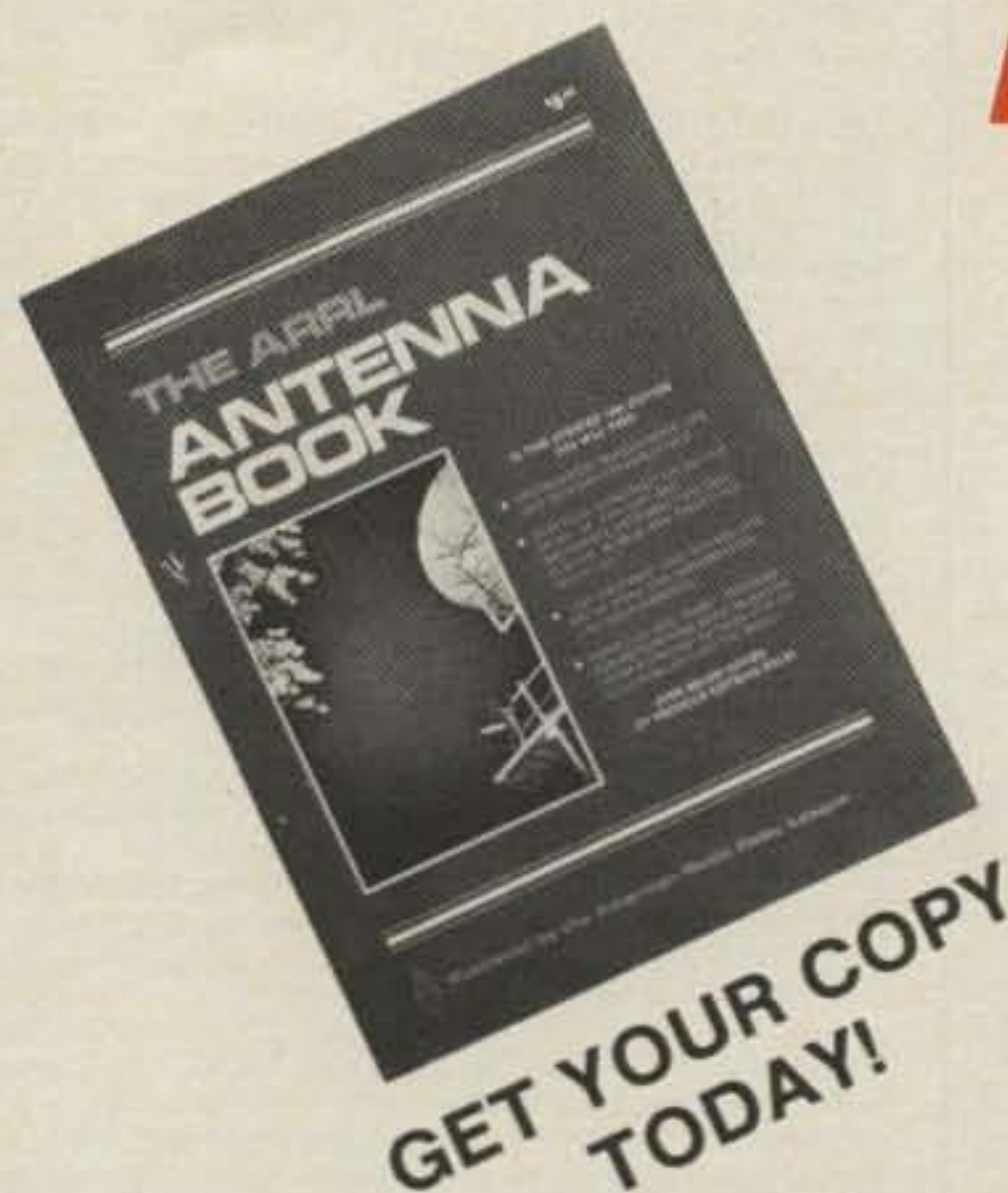
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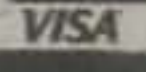
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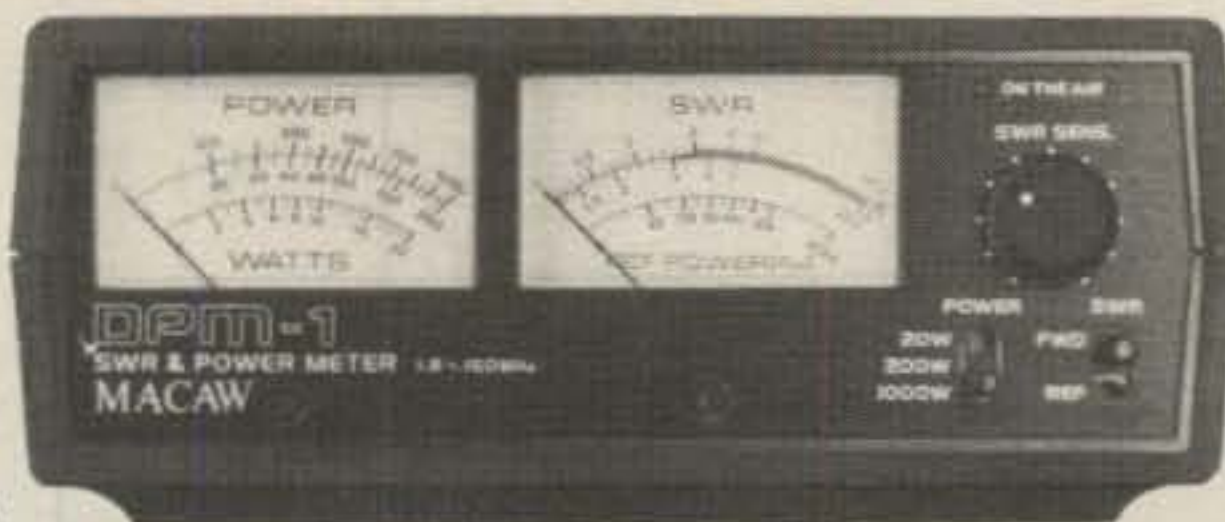
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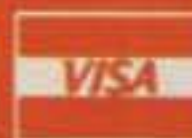
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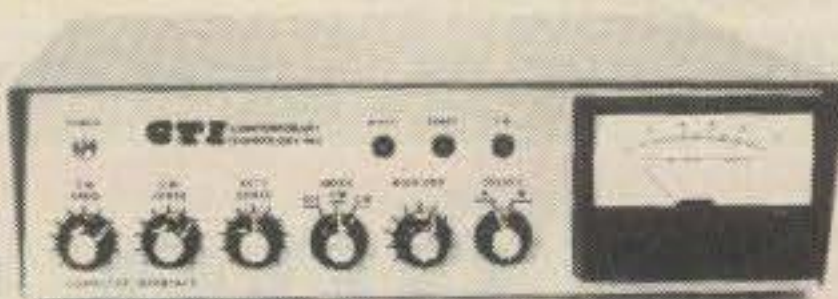
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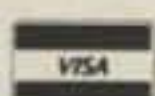
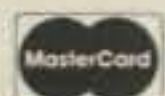
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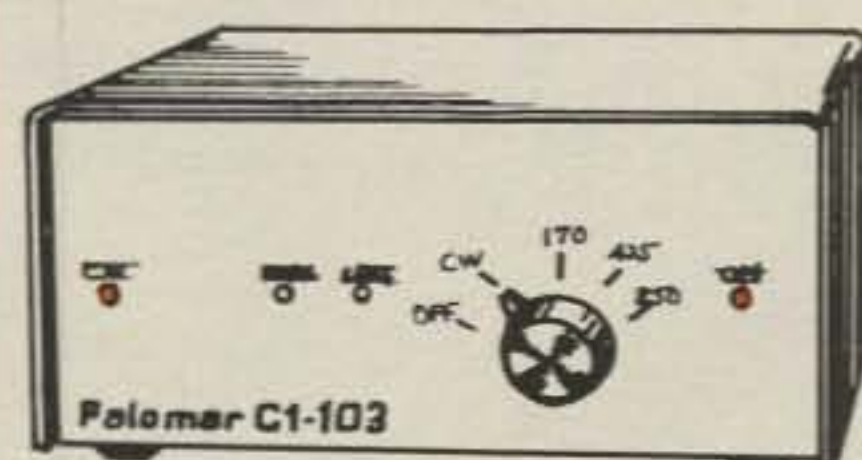
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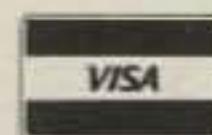


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FT-680R 10W RF: 50-54 MHz

FT-480R 10W RF: 143.5-148.5 MHz

FT-780R 10W RF: 430-440 MHz

CIRCLE 139 ON READER SERVICE CARD

YAESU *The radio.*

YAESU ELECTRONICS CORP., 6851 Walthall Way, Paramount, CA 90723 • (213) 633-4007

YAESU Cincinnati Service Center, 9070 Gold Park Drive, Hamilton, OH 45011 • (513) 874-3100

ANTENNA/TOWER SALE!



**BUTTERNUT
ELECTRONICS CO.**

- Designed to operate on all Amateur Bands at "FULL" Legal Power Input.
- Automatic Band Switching (80/10 meters).
- Automatic Band Switching (160/10 meters) with optional model TBR-160 HD.
- IN STOCK for IMMEDIATE DELIVERY & LOOK at very SPECIAL PRICES...
- New Model HF6V \$129.00
- New Model TBR-160HD (High Power 160 meter Base Resonator) \$49.00.
- Model RMK-11 (roof mount kit with multiband radial kit \$39.00.
- Model STR-2 (Stub Tuned Radial Kit) \$29.00.

Delivery Anywhere In The Continental USA At No Additional Cost. (Free Shipping On Butternut Accessories Also When Purchased With Antenna.)

UNARCO-ROHN Self Supporting Towers — On Sale!

Freight Prepaid

These rugged beauties are being offered at Big Discounts and - we are shipping them freight prepaid! Look over the specifications and pick the unit most suited for your needs, then - Call us to place your order with Mastercard/Visa or write and include your check for quick shipment - Freight Prepaid!

And — Save even more — include antenna and rotor of your choice with the order and we will ship them along freight prepaid also! How's that for good old fashioned savings?

Tower Model	Tower Ht.	Load Rating	Ship Weight	Tower Base	Tower Price	Base Price	Total Price
HBX40	40 ft	10 sq ft	164	BX86	289	24	313
HBX48	48 ft	10 sq ft	303	BX87	369	26	395
HBX56	56 ft	10 sq ft	385	BX88	449	30	479
HDBX40	40 ft	18 sq ft	281	BX87	339	26	365
HDBX48	48 ft	18 sq ft	363	BX88	429	30	459

hy-gain

CRANKUP SALE!

All Models Shipped
Factory Direct—
Freight Paid*!

- Check these features:
- All steel construction
 - Hot dip galvanized after fabrication
 - Complete with base and rotor plate
 - Totally self-supporting—no guys needed

Model	Height	Load	Sale Price
HG37SS	37 ft.	9 sq. ft.	\$ 967
HG52SS	52 ft.	9 sq. ft.	\$ 959
HG54HD	54 ft.	16 sq. ft.	\$1499
HG70HD	70 ft.	16 sq. ft.	\$2399

Masts—Thrust Bearings—
Other Accessories Available
—Call! Prices Shown Are
Your Total Delivered Price
In Continental U.S.A.!

RG-213U \$.29/ft \$279/1000 ft Up to 600 ft via UPS

- RG-213/U—95% Bare Copper Shield
- Mil-Spec Non-contaminating Jacket for longer life than RG8 cables.
- Our RG-213/U uses virgin materials.
- Guaranteed Highest Quality!

RG-8X \$.19/ft \$179/1000 ft

- RG8X—95% Bare Copper Shield • Low Loss
- Non-contaminating Vinyl Jacket • Foam Dielectric

Coaxial Cable Loss Characteristics (DB/100 ft)					
Cable Type	Imped.	10MHz	30MHz	150MHz	450MHz
RG-213/U	50	.6	.9	2.3	5.2
RG8X	52	.8	1.2	3.5	6.8
RG-58/U	52	1.4	1.9	6.0	12.5
1/2" Alum	50	.3	.5	1.2	2.2
1/2" Helix	50	.2	.4	.9	1.6
3/4" Helix	50	.1	.2	.5	.9

HARDLINE/HELIX™

- Lowest Loss for VHF/UHF!
- 1/2" Alum. w/poly Jacket \$.79/ft
 - 1/2" LDF-50 Andrew Helix™ \$1.49/ft
 - 3/4" LDF-50 Andrew Helix™ \$3.99/ft
- select connectors below.

HARDLINE & HELIX™ CONNECTORS

Cable Type	UHF F/M	UHF MALE	N F/M	N MALE
1/2" Alum	\$19	\$19	\$19	\$25
1/2" Helix™	\$22	\$22	\$22	\$22
3/4" Helix™	\$49	\$49	\$49	\$49

AMPHENOL CONNECTORS

Silver PL259	\$1.25	Nickle PL259	\$.90
UG21B N Male	\$2.95	UG23D N Female	\$2.95

ANTENNA WIRE & ACCESSORIES

12 Ga. Copperweld	\$.12/ft	14 Ga. Copperweld	\$.10/ft
14 Ga. Stranded	\$.10/ft	18 Ga. Copperweld	1/4 mi \$30
450 Ohm H.D. Line	\$.16/ft	H.D. End Insulators	\$2/ea
Van Gorden 1:1 Balun			\$11
Van Gorden Center Insulator			\$6

HUSTLER

6BTV 80-10 mtr Vert.	\$129
4BTV 40-10 mtr Vert.	\$89
5BTV 80-10 mtr Vert.	\$109
G6-144B 2-mtr Base	\$89
G7-144 2-mtr Base	\$119

Mobile Resonators	10m	15m	20m	40m	75m
400W Standard	\$12	\$12	\$15	\$18	\$22
2KW Super	\$18	\$20	\$22	\$26	\$36

Bumper Mounts - Springs - Folding Masts in Stock!

CUSHCRAFT

MULTI-BAND HF ANTENNAS

A3 3-el Tribander	\$219	A4 4-el Tribander	\$289
R3 20/15/10mtr Vert	\$279	A743/A744 40mtr Kit	\$75

HF MONO-BAND ANTENNAS

10-3CD	\$ 95	10-4CD	\$109
15-3CD	\$119	15-4CD	\$129
20-3CD	\$199	20-4CD	\$279
40-2CD	\$289	D40	\$149

VHF/UHF BEAMS

A50-5	\$ 79	617B	\$199
214B	\$ 79	3219	\$ 95
220B	\$ 95	424B	\$ 79

OSCAR/TWIST ANTENNAS

A144-10T	\$ 52	A144-20T	\$ 75
A147-20T	\$ 63	416TB	\$ 59
A14TMB	\$ 29	PS4	\$ 69

VHF/UHF FM ANTENNAS

A147-4	\$ 29	A147-11	\$ 49
214FB	\$ 79	228FB	\$219
A449-6	\$ 29	ARX2B	\$ 39

HY-GAIN

Broadband 3-el Triband Beam Explorer-14, In Stock—\$289

QK710 30/40 mtr. Add-On-Kit	\$79.00
V2S 2-mtr Base Vertical	\$39
TH5MK2S Broad Band 5-el Triband Beam	\$389
TH7DXS 7-el Triband Beam	\$439
TH3JRS 3-el Triband Beam	\$179
TH2MK3S 2-el Triband Beam	\$159
HY-QUAD 2-el Triband Quad	\$299
402BAS 2-el 40-mtr Beam	\$219
205BAS 5-el 20-mtr Beam	\$329
155BAS 5-el 15-mtr Beam	\$189
105BAS 5-el 10-mtr Beam	\$129
204BAS 4-el 20-mtr Beam	\$249
203BAS 3-el 20-mtr Beam	\$149
153BAS 3-el 15-mtr Beam	\$89
103BAS 3-el 10-mtr Beam	\$69
DB1015BAS 3-el 10/15 mtr Beam	\$179
64BS 4-el 6-mtr Beam	\$59
66BS 6-el 6-mtr Beam	\$119
18HTS 80-10 mtr Hy-Tower Vertical	\$429
LC-160 160-mtr Coil Kit for 18HTS	\$39
214 14-el 2-mtr Beam	\$39
2BDQ 80/40 mtr Trap Dipole	\$59
5BDQ 80-10 mtr Trap Dipole	\$119
BN86 80-10 mtr KW Balun W/Coax Seal	\$15

MOSLEY

CL-33 3-el Triband Beam	\$279
TA-33 3-el Triband Beam	\$249
TA-33JR 3-el Triband Beam	\$189
TA40KR 40mtr Kit for TA33	\$119

Tri-Ex TOWERS

SPECIAL PRICES! SAVES!

Model	Height Up	Down	Wind Load	List	Sale
W36	36.0 ft	20.5 ft	9.0 sq ft	\$694	\$579
WT51	51.0 ft	20.5 ft	9.0 sq ft	\$1154	\$999
LM354	54.0 ft	21.0 ft	16 sq ft	\$2010	\$1599
LM470D	70.0 ft	22.0 ft	16 sq ft	\$4195	\$2999
(Motorized)					
DX86	86.0 ft	23.0 ft	25 sq ft	\$6200	Call
(Motorized)					

ALPHA DELTA COMMUNICATIONS

Transi-Trap™ Surge Protectors—In Stock Now!

Model LT 200W UHF Type	\$19
Model HT 2KW UHF Type	\$29
Model LT/N 200W N Type	\$39
Model HT/N 2KW N Type	\$44
Model R-T 200W Deluxe	\$29
Model HV 2KW Deluxe	\$32

KLM

KT34A 4-el Broad Band Triband Beam	\$309
KT34XA 6-el Broad Band Triband Beam	\$469
3.8-1 80-mtr Rotatable Dipole	\$429
7.2-1 40-mtr Rotatable Dipole	\$159
7.2-2 2-el 40-mtr Beam	\$289
7.2-3 3-el 40-mtr Beam	\$439
7.2-4A 4-el 40-mtr Beam	\$599
6el-20mtr Big Stick Monoband Beam	\$599
6el-15mtr Big Stick Monoband Beam	\$389
6el-10mtr Big Stick Monoband Beam	\$229
10-30-7LP Log Periodic Broad Band Beam	\$599
144-148-13LBA 13-el 2-mtr Beam	\$79
143-150-14C 14-el 2-mtr Satellite Antenna	\$79
420-470-18C 435 MHz Satellite Antenna	\$59
432-16LB 432 MHz Long Boom Antenna	\$59

MINI-PRODUCTS HQ-1 only \$159!

Wing Span	11 ft
Boom	54 in. long
Wind Area	1.5 sq ft
1200W P.E.P. Input	
6-10-15-20 mtrs	

ROTORS & CABLES

Alliance HD73 (10.7 sq ft rating)	\$109
Alliance U100 (for small beams & elevation)	\$49
Telex HAM 4 (15 sq ft rating)	\$199
Telex Tailtwister (20 sq ft rating)	\$249
Telex HDR300 Heavy Duty (25 sq ft rating)	\$479
Kenpro KR-500 Heavy duty elevation rotor	\$189.00
Standard 8 cond cable	\$.19/ft
(vinyl jacket 2-#18 & 6-#22 ga)	
Heavy Duty 8 Cond cable	\$.36/ft
(vinyl jacket 2-#16 & 6-#18 ga)	

UNR-ROHN GUYED TOWERS

10 ft Sections 20G \$37.50 25G \$46.50 45G \$107.50

Foldover Towers	Model	Height	Ant Load*	Price
	FK2548	48 ft	15.4 sq ft	\$829
	FK2558	58 ft	13.3 sq ft	\$ 899
	FK2568	68 ft	11.7 sq ft	\$ 959
	FK4544	44 ft	34.8 sq ft	\$1159
	FK4554	54 ft	29.1 sq ft	\$1259
	FK4564	64 ft	28.4 sq ft	\$1359

25G Foldover Double Guy Kit \$199
45G Foldover Double Guy Kit \$229

*Above antenna loads for 70 MPH winds and Guys at Hinge & Apex.

All Foldover Towers Shipped Freight Pre-Paid!

Foldover prices 10% higher west of Rockies.

All Rohn 25G & 45G Accessories in stock - Call!

TOWER/GUY HARDWARE

3/16" EHS Guywire (3990 lb rating)	\$.13/ft
1/4" EHS Guywire (6000 lb rating)	\$.16/ft
5/32" 7 x 7 Aircraft Cable (2700 lb rating)	\$.12/ft
3/16" CCM Cable Clamp (3/16" or 5/32" Cable)	\$.35
1/4" CCM Cable Clamp (1/4" Cable)	\$.45
1/4" TH Thimble (fits all sizes)	\$.30
3/8" EEE (3/8" Eye & Eye Turnbuckle)	\$5.95
3/8" EJ (3/8" Eye & Jaw Turnbuckle)	\$6.95
1/2" EE (1/2" Eye & Eye Turnbuckle)	\$8.95
1/2" EJ (1/2" Eye & Jaw Turnbuckle)	\$9.95
3/16" Preformed Guy Grip	\$1.99
1/4" Preformed Guy Grip	\$2.49
6" Diam - 4 ft Long Earth Screw Anchor	\$12.95
500D Guy Insulator (5/32" or 3/16" Cable)	\$1.39
502 Guy Insulator (1/4" Cable)	\$2.49
5/8" Diam - 8 ft Copper Clad Ground Rod	\$12.95

PHILLYSTRAN GUY CABLE

HPTG2100 Guy Cable (2100 lb rating)	\$.29/ft
HPTG4000 Guy Cable (4000 lb rating)	\$.43/ft
HPTG6700 Guy Cable (6700 lb rating)	\$.69/ft
9901LD Cable End (for 2100/4000 cable)	\$6.95
9902LD Cable End (for 6700 cable)	\$7.95
Socketfast Potting Compound (does 6-8 ends)	\$12.95

GALVANIZED STEEL MASTS

Heavy Duty Steel Masts 2 in OD - Galvanized Finish				
Length	5 FT	10 FT	15 FT	20 FT
12 in Wall	\$25	\$39	\$59	\$79
18 in Wall	\$39	\$69	\$99	\$109
25 in Wall	\$69	\$129	\$189	\$249

SOUTH RIVER ROOF TRIPODS

HDT-3 3 ft Tripod	\$19	HDT-5 5 ft Tripod	\$29
HDT-10 10 ft Tripod	\$49	HDT-15 15 ft Tripod	\$69

Heavy Duty Tripods include mtg hdw-UPS Shippable

MasterCard

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1108 Summit Ave., Suite 4 / Plano, Texas 75074

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VISA

CIRCLE 43 ON READER SERVICE CARD

COMMUNICATIONS EQUIPMENT SALE!

ICOM



**ICOM IC-751A LIST PRICE \$1399
CALL FOR SPECIAL SALE PRICE!**



**ICOM IC-745 LIST PRICE \$999
CALL FOR SPECIAL SALE PRICE!**

KENWOOD



**TS-930S LIST PRICE \$1799
CALL FOR SPECIAL SALE PRICE!**



**TS-430S LIST PRICE \$899.95
CALL FOR SPECIAL SALE PRICE!**



**FT-757GX LIST PRICE \$829
CALL FOR SPECIAL SALE PRICE!**



**FT-726R LIST PRICE \$829
CALL FOR SPECIAL SALE PRICE!**

WE ARE FACTORY AUTHORIZED DEALERS FOR ALL MAJOR AMATEUR LINES

AEA CP-1 Computer Patch \$179



CP-20 Computer Patch with
Vic-20 Software \$219
CP-64 Computer Patch with
Com-64 Software \$219

Other AEA Items In Stock.
Call For Your Special Price.

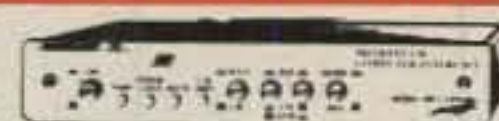
KANTRONICS



The Interface Reg. \$169.95 Sale \$129.00

The Interface II Reg. \$269.95 Sale \$239.00

Apple Amior	VIC-20 Hamsoft	49
Soft/Hamtext	Hamtext VIC-20	99
Vic-20 Amior Soft	Hamtext Model-64	99
Model 64 Amior Soft	Atari Hamsoft	49
Apple Hamsoft	TRS-80C Hamsoft	59



MFJ-1224 INTERFACE \$89

101 24 Hr Clock	\$29
104 Dual Clock	33
202B Noise Bridge	59
250 2KW Dummy w/Oil	35
260 300W Dry Load	29
262 2KW Dry Load	59
401 Keyer	49
422 Keyer w/Paddle	89
900 300W Tuner	54
901 300W Tuner w/Balun	59
940B Tuner w/Meter	79
941C Tuner w/Meter	89
949B Deluxe 300W Tuner	129
989 Deluxe 2KW Tuner	299

KDK FM2030



List \$599
SALE \$269!

SANTEC



SM-3 Speaker Mic	33
ST-LC Leather Case	33
ST40C Base Charger	69
ST144µP Handie Talkie	269
ST-440µP 440 MHz H.T.	279
ST-500B3 Ni-Cad Battery	29

**TOKYO
HY-POWER LABS**



Regular \$69.95 SALE \$59!

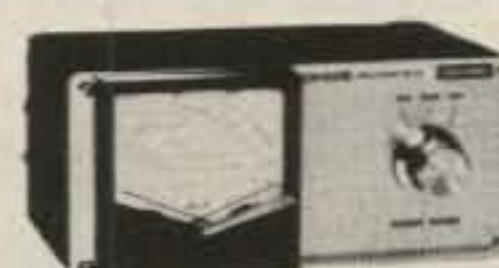
HL-30V 2 Meters, 2W In - 30W Out

HL-82V	\$139	HL-90U	329
HL-160V	289	HC-200	89
HL-20U	99	HC-2000	289



JANEL QSA5 PREAMP \$39!

QSA-6	\$41	432PL	\$59
PB-30	\$25	PB144	\$25
PB-50	\$25	PB220	\$25



DAIWA CN-820B \$111!

160/2 mtrs
20/200/2000 wts



BENCHER PADDLE
BY-1 Blackbase \$39
BY-2 Chrome \$49

**MIRAGE AMPLIFIER
SALE!**



Model	Band	Pre-amp	Input	Output	DC Pwr	Sale Price
A1015	6M	Yes	10W	150W	20A	\$249
B23	2M	No	2W	30W	5A	\$ 79
B215	2M	Yes	2W	150W	22A	\$259
B108	2M	Yes	10W	80W	10A	\$159
B1016	2M	Yes	10W	160W	20A	\$249
B3016	2M	Yes	30W	160W	17A	\$199
C22	220	No	2W	20W	5A	\$ 79
C106	220	Yes	10W	60W	10A	\$179
C1012	220	Yes	10W	120W	20A	\$259
D24	440	No	2W	40W	8A	\$179
D1010N	440	No	10W	100W	20A	\$289

RC-1 Remote Control for Mirage Amplifiers \$24
MP-1 and MP-2 Peak-Reading Wattmeter \$99

ASTRON POWER SUPPLIES

Heavy Duty - High Quality - Rugged - Reliable

- Input Voltage: 105-125 VAC Output: 13.8 VDC ± .05V
- Fully Electronically Regulated—5mV Maximum Ripple
- Current Limiting & Crowbar Protection Circuits
- M-Series With Meter—A-Series Without Meter

Model	Cont. Amps	ICS Amps	Price
RS4A	3	4	\$ 39
RS7A	5	7	49
RS12A	9	12	69
RS20A	16	20	89
RS20M	16	20	109
RS35A	25	35	135
RS35M	25	35	149
RS50A	37	50	199
RS50M	37	50	229



MODEL RS-50A

TEN-TEC



FREE ... Ten-Tec Power Supply Model #260 (List Price \$199) with Purchase of Ten-Tec Corsair at \$1,169.

525D Argosy	\$529	4229 Antenna Tuner Kit	\$189
229 KW Antenna Tuner	\$259	2591 New 2 Meter HT	\$275

All Other Ten-Tec Accessories In Stock. Please Call For Your Special Prices.

HAL

CWR6850 \$749!

CWR6700	\$439
CWR6750	629
DS3100ASR	1699
MPT3100	2199
RS2100	289
ST5000	219
ST6000	649
DSK3100	1049
ARQ1000	649
KG-12	169



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YAESU SALE!



FT-ONE

GENERAL COVERAGE—ALL MODE
DELUXE SOLID STATE TRANSCEIVER

Buy Now and Receive These Accessories Free:
300Hz CW Filter, \$FREE 600Hz CW Filter, \$FREE
800Hz CW Filter, \$FREE 6KHz AM Filter, \$FREE
Memory Backup, \$FREE Installation, \$FREE

List Price \$3074. CALL FOR YOUR SPECIAL PRICE!
Quantities Limited — Hurry!



FT-980

CAT SYSTEM—Computer Aided Transceiver

- Wide Dynamic Range
- General Coverage
- All Mode Transceiver—CW/SSB/AM/FM/FSK!
- Full Break-in CW
- Variable Bandwidth
- AC Power Supply
- 12 Internal Digital VFO's with Memories
- Much, much more—call or write for info
- Low Noise Front End
- 10Hz Digital Readout
- RF Speech Processor
- IF Shift
- APF/Notch
- Adjustable Noise Blanker

Computer Interface now in development—
Own Tomorrow's HF Transceiver—Today!!
Manufacturer's Suggested List Price \$1499
Call For Your Special Price Today!!



FT-102

160-10MTR WITH WARC BANDS TRANSCEIVER

- Digital Readout
- Variable Bandwidth
- CW/SSB/AM/FM Modes
- Noise Blanker
- Built-in AC Supply
- IF Shift
- RF Speech Processor
- Much, much more—

List Price \$1149—Call for Special Low Texas
Towers Discount Price and Save \$\$\$



FT-77

New 80-10mtr Compact HF Transceiver

- Digital Readout
- CW/SSB/FM Modes
- Optional AC Supply, CW Filter, FM Unit
- External VFO, Antenna Tuner Available
- Adj Noise Blanker
- CW Wide/Narrow

List Price \$599—Call for Special Low Texas Towers
Discount Price and Save \$\$



FT-230R 2mtr FM.....\$359
FT-730R 440Mhz FM.....\$399

- 10 Memories
- LCD Readout
- Memory or Up/Down Scan
- Two VFO's
- 25W Out

Call today for Special Discount
Price & Save \$\$



FT-728R
VHF/UHF
All Mode Tri-Band Transceiver

- 50-54 Mhz
- 144-148 Mhz
- 10 watts output on all bands
- 430-450 Mhz
- 21, 24.5 & 28 Mhz
option available soon

Please Call For Price & Delivery
Information



VHF/UHF Multimode Portables

FT-690R 50Mhz.....\$379
FT-290R 144Mhz.....\$399
FT-790R 430Mhz.....\$399

Call today for Special Discount
Price & Save \$\$



FRG-7700

All Mode Digital Communications Receiver .15 to
29.99Mhz—Receives SSB/AM/FM/CW, Built-in S
Meter, Speaker, Noise Blanker, Timer, FM Squelch,
AC Supply and More!

Manufacturer's List \$499—Call today for Your
Special Discount Price!!

FT-208R 2mtr HT.....\$319
RF Out: 300mw/2.5W

FT-708R 440Mhz HT.....\$319
RF Out: 200mw/1.0W

- LCD Display
- Up/Down and Memory Scanning
- Complete w/Nicad Battery,
Charger and Rubber Duck Ant

Accessories Available:
LCC-8 Leather Case.....\$35
YM24A Spkr/Mic.....\$39
FNB-2 Nicad.....\$29
NC-8 Base Chgr.....\$99
Call for Special Yaesu Discount
Prices!!



ETD ALPHA



76PA \$1699



ALPHA 78



ALPHA 374A

SPECIAL SALE PRICES

Model	List	Sale
77DX	\$5450	*
78	\$3495	*
374A	\$2595	*
76A	\$1985	*
76PA	\$2395	*
76CA	\$2695	*

*Sale Prices Too Low To Print!!
Call For Your Special Prices!!



TOKYO HY-POWER
HC-2000 Tuner

\$339.95 List Price

SALE \$289.00

- Heavy Duty 2 KW Construction
- 160-10 Meter Operation (in-
cluding WARC Bands)
- Calibrated Vernier Dial
- Built-in SWR and Watt Meter
- Built-in 12 Position
Antenna/By-pass Switch
- Built-in Balun for Balanced
Feedline

**IMPORTANT — Prices shown are suggested by the Manufacturer.
You can Save Money with a Big Texas Towers Discount!
Call today for our Special Yaesu Sale Prices and Save \$\$\$!!**



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Div. of Texas RF Distributors Inc.
1108 Summit Ave., Suite 4 • Plano, Texas 75074

Telephone
(214) 422-7306

FT-77 The Rig for All Seasons!

Answering the call for an HF rig that goes everywhere, sounds great, and is cost-effective, Yaesu proudly introduces the FT-77 Compact HF Transceiver System.



Computerized Design and Manufacture

The FT-77 design engineers utilized the latest computerized circuit board layout methods, resulting in a compact, reliable transceiver with maximum utilization of available space. Automated insertion techniques are used in assembly, providing improved reliability and quality control over earlier designs.

Operating Versatility

The FT-77 is equipped for operation on all amateur bands between 3.5 and 29.7 MHz, including the three new WARC bands. Fully operational on SSB and CW, the FT-77 includes a dual width noise blanker (designed to minimize the "Woodpecker" or ignition noise), full SWR metering, R.I.T., and optional CW filter with wide/narrow selection. The optional FM-77 permits operation on the FM mode, with front panel squelch sensitivity control.

Expandable Station Concept

Ideal for mobile operation because of its compact size and light weight, the FT-77 forms the nucleus of a versatile base station. Available as options for the FT-77 are the FP-700 AC Power Supply, FV-700DM Synthesized External VFO and Memory System, FTV-707 VHF/UHF Transverter, and FC-700 Antenna Coupler, providing top performance at an extraordinarily low price.

Best of All, It's a Yaesu!

With most experience in transceiver design and manufacture, the Yaesu trademark is your guarantee of quality and durability. We've got all-new technology and an all-new warranty policy to back it up.

See the FT-77 and the all new line of Yaesu HF, VHF, and UHF transceivers, receivers and accessories at your Yaesu Dealer today! It's time you tried a Yaesu!

CIRCLE 4 ON READER SERVICE CARD

Price And Specifications Subject To
Change Without Notice Or Obligation

YAESU
The radio.



0283

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YAESU ELECTRONICS Eastern Service Ctr., 9812 Princeton-Glendale Rd., Cincinnati, OH 45146 • (513) 874-3100

NEW!

ICOM IC-745

A New Transceiver Worth Celebrating!



9 HAM BANDS!

GENERAL COVERAGE RECEIVER!

16 MEMORIES!

SCANNING!

PASSBAND TUNING!

VARIABLE NB & AGC!

What's the celebration about? The IC-745... a new all ham band HF transceiver with SSB, AM, CW, RTTY and an FM option... plus, a 100kHz — 30MHz general coverage receiver.

And... the IC-745 has a combination of features found on no other transceiver at such an incredibly low price.

Compare these exceptional features:

- 100kHz — 30MHz Receiver
- 16 Memories
- Full function Metering with a built in SWR Bridge
- IF Shift and Pass Band Tuning
- 10Hz / 100Hz / 1kHz Tuning Rates with 1MHz band steps
- Optional Internal AC Power Supply

- Adjustable Noise Blanker (width and level)
- Continuously Adjustable AGC with an OFF position
- Receiver Preamp
- 100% Transmit Duty Cycle

Other Standard Features:

- 100 Watt Output Transmitter with exceptionally low IMD
- VOX
- Speech Compressor
- Tunable Notch Filter
- RIT and XIT
- All Mode Squelch
- Scanning
- ICOM System Compatibility

Optional Accessories:

- IC-PS15 External Power Supply

- IC-PS35 Internal Power Supply for the ultimate in Portability
- IC-2KL Linear Amplifier
- IC-SP3 External Speaker
- IC-MB12 Mobile Mounting Bracket
- IC-AT100 Antenna Tuner (100W)
- IC-AT500 Antenna Tuner (500W)
- IC-HP1 Headphones
- IC-EX241 Marker Module
- IC-EX242 FM Module
- IC-EX243 Electronic Keyer
- IC-FL52A 500Hz 455kHz CW Filter
- IC-FL45 500Hz 9MHz CW Filter

- IC-FL54 270Hz 9MHz CW Filter
- IC-FL53A 250Hz 455MHz CW Filter
- IC-FL44A 2.1kHz 455kHz SSB Filter
- IC-SM6 Desk Mic
- IC-HM12 Hand Mic

The IC-745 is the only transceiver today that has such features standard... the number of options and accessories available... and such a low price.

ICOM is... *Simply the Best* in quality built ham equipment today. See the IC-745 at your local authorized ICOM dealer or contact ICOM for more information.

CIRCLE 64 ON READER SERVICE CARD

 **ICOM**
The World System

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All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions.